

Maxi Sky 2

Maintenance and Repair Manual

ARJOHUNTLEIGH
GETINGE GROUP



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NOTICE

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- C. If the terms listed below are used in the text, their meaning is as follows:

DANGER

ELECTRICAL HAZARD WARNING: FAILURE TO UNDERSTAND AND FOLLOW THESE INSTRUCTIONS MAY RESULT IN AN ELECTRICAL SHOCK.

WARNING

FAILURE TO UNDERSTAND AND FOLLOW THESE INSTRUCTIONS
MAY RESULT IN INJURY TO YOU OR TO OTHERS.

CAUTION

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY CAUSE DAMAGE
TO ALL OR PARTS OF THE SYSTEMS OR EQUIPMENT.

NOTE

THIS IS IMPORTANT FOR THE CORRECT USE OF THIS SYSTEM OR EQUIPMENT.

- D. Dangerous substances: If using hazardous substances be sure on how to handle them and refer to applicable information. When in doubt, refer to the local authorities for health and safety requirements.
- E. It is strongly recommended that every technician follows the procedures as indicated in this manual. Every procedure has been studied in perspective on minimizing the risks either for the technician or the ceiling lift. Even if some of the procedures are not the shortest ones, they are the most effective in the long run.

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MANUAL VERSIONS

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UPDATING INSTRUCTIONS

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VERIFY THAT THE LATEST UPDATES HAVE BEEN IMPLEMENTED

Verify on Careprosis (<http://www.careprosis.com>) if there were any field correction bulletins, safety notices or technical bulletins that have been published since the last service.

This verification must be done to keep the product up to date according to safety and product improvements. Bulletins and notices can be generated as a result of an engineering change note, a safety incident report or a change to form/fit etc.

Example of a Technical Bulletin

TECHNICAL
ARJO 
TECHNICAL BULLETIN

Date:	March 23, 2005
From:	Mark Massie
Subject:	CARENDO
Product Group:	BIB
Document number:	ARIE 26, 2005 - 007
Issue:	ARIE 29/2005
Case No.:	205

CARENDO – bad noise, corrosion on bearings

Background
 We have received a small but significant number of complaints from the Netherlands on CARENDO giving an annoying noise when being operated. It was observed that the bearings had a white layer (corrosion product?). Products were returned to factory for analysing and additional testing on factory samples were also made. Case no 205 was opened to investigate the complaint.

Result of investigation
 Tests show that the white layer was "white rust". The bearings are made of aluminium, which is stable against corrosion in the pH -range 4-9, but high acid or alkali content in the environment may cause the aluminium to corrode. It is from the samples obvious that the Carenndo sometimes can be exposed to such environment. The corrosion is not safety critical in any aspect but will cause the reported annoying noise and will of course make a bad impression and therefore product improvements as described below has been made.

Product improvements/ corrective actions
 The bearings had originally a surface treatment with Electro-coating including Ferro-phosphatising to prevent corrosion, this process has been enhanced. From November 2004 all bearings are pre-treated using the new technology with Zink- phosphatising, which gives an active protection against corrosion. Further more to prevent corrosion all bearings are grease in production using Shell Cassida RLS2. This greasing is implemented in production with the new chassis in November 2004, SEE0448434.

Greasing of the bearings is also included in the Preventive Maintenance Schedule (PMS) in the last edition (November 2004) of the Operating and Product Care Instructions and the next issue of the Maintenance and Repair Manual (MRM) will be updated accordingly. The greasing is specified to be performed every year by ARJO authorised service. (See attached for a copy of the greasing procedure).

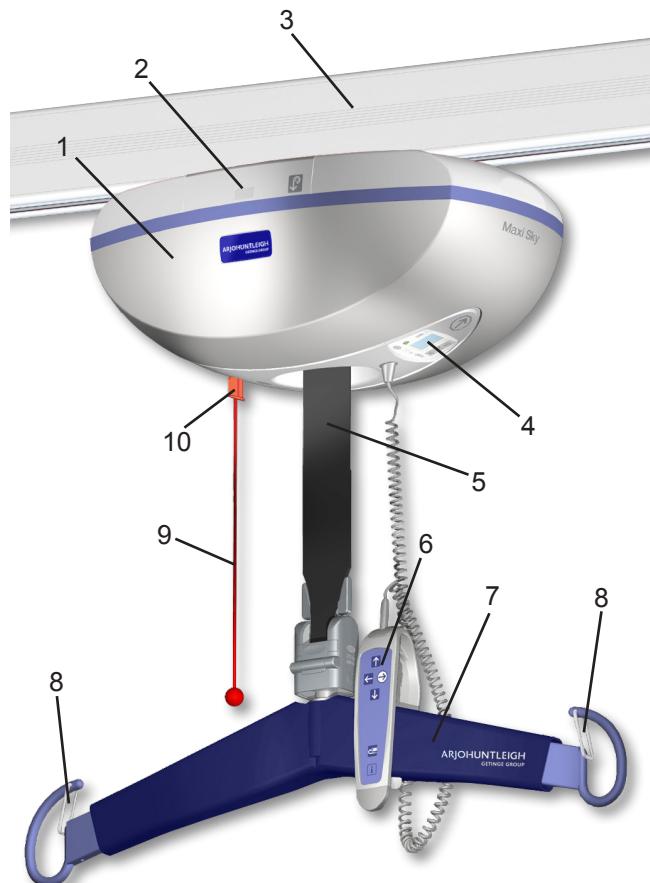
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GENERAL INFORMATION

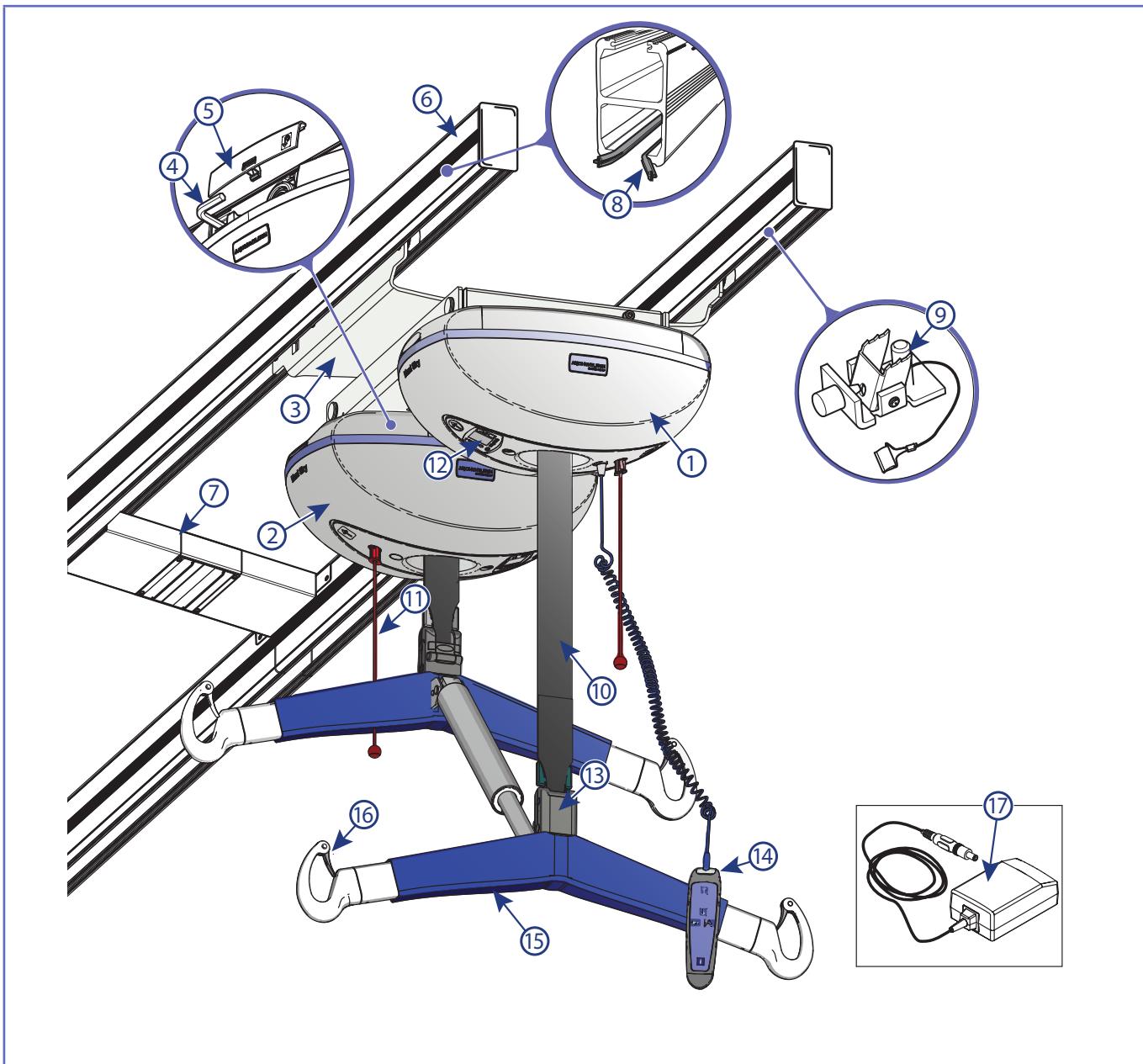
4

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MAXI SKY 2



1. Lift
2. Manual emergency lowering mechanism (with Hex key inside)
3. Rail
4. Control panel
5. Strap
6. Hand control
7. Spreader bar
8. Latches
9. Red emergency stop cord
10. Emergency off switch - Pull / Power on switch - push

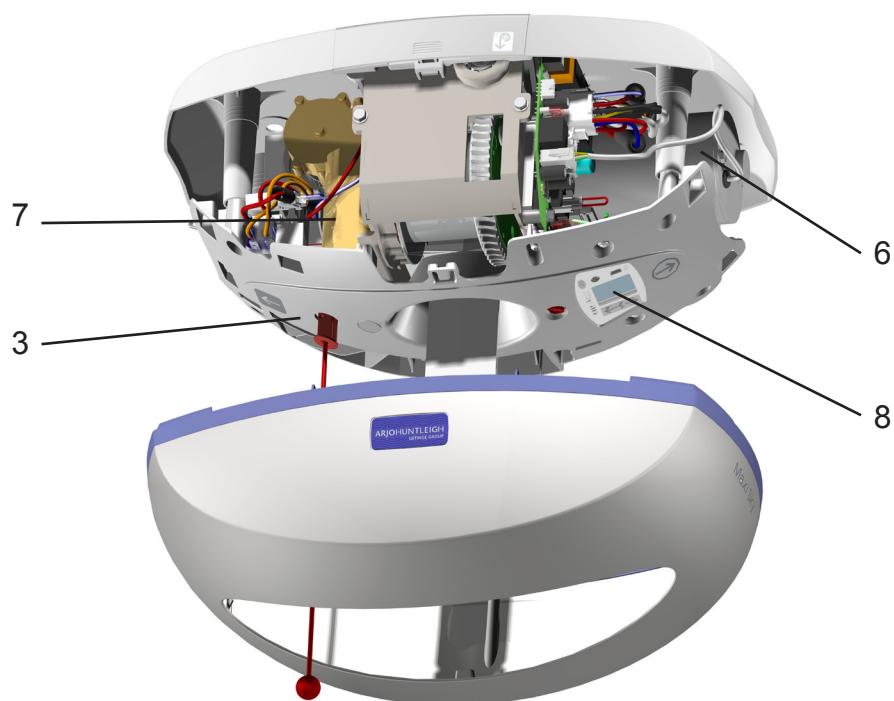
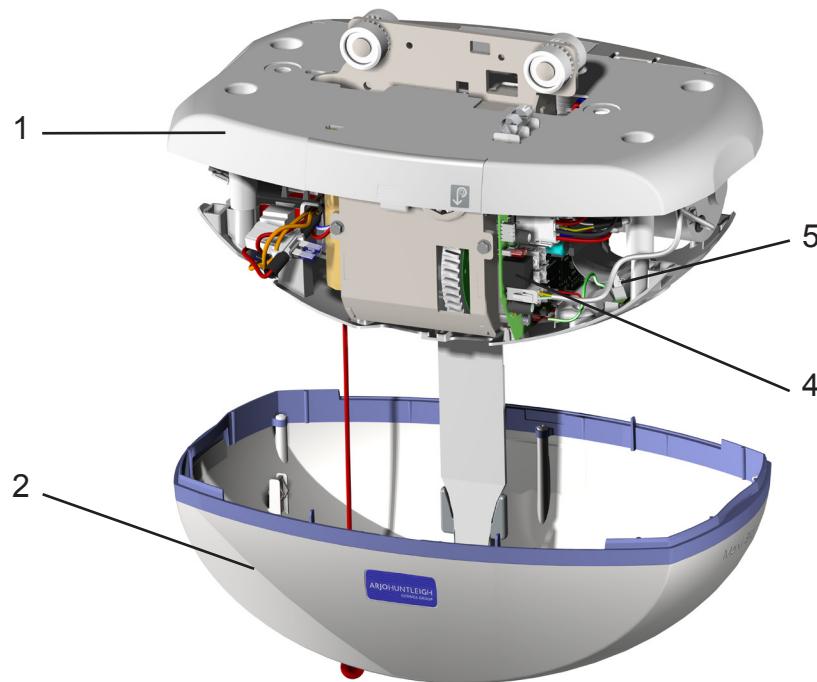


Legend

① Leading ceiling lift (with hand control)	⑥ KWIKtrak rail	⑪ Red emergency stop cord	⑯ Latch
② Driven ceiling lift	⑦ Charging station*	⑫ Control panel	⑰ Universal charger
③ Trolley	⑧ Enhanced Charging System (ECS) strips*	⑬ Quick connect	
④ Emergency lowering hex key	⑨ KWIKtrak end stopper	⑭ Hand control	
⑤ Access door for emergency lowering mechanism	⑩ Strap	⑮ Spreader bar	

* This system is equipped with either a charging station or the ECS charging system.

LIFT'S MAIN PARTS



1. Top cabin
2. Bottom cabin
3. Strap inlet
4. Main board
5. User interface board
6. Up/down motor
7. Left/right motor
8. LCD screen (part of the user interface board)

INTRODUCTION

This document covers the maintenance and repair of the *Maxi Sky 2* and *Maxi Sky 2 Plus*.

Maxi Sky 2 has a maximum capacity of:

- 272 kg (600 lb).

The *Maxi Sky 2 Plus* has a maximum capacity of:

- 454 kg (1000 lb) when set in dual mode.

- 272 kg (600) when set in single mode.

NOTE

THE SAFE WORKING LOAD (SWL) WILL DEPEND ON THE LIFT'S
CONFIGURATION MAXIMUM SWL REFERS TO THAT OF THE LOWEST RATED
ATTACHMENTS, AS WELL AS RAIL INSTALLATION

FEATURES

The emergency features of the *Maxi Sky 2* ceiling lift include:

<ul style="list-style-type: none"> - Stop. - Overload current limit protection in the PCB. - Upper limit switch. - Lower limit switch/no tension limit. 	<ul style="list-style-type: none"> - Control panel on the unit / LED display - Manual emergency lowering mechanism. - Audible variable low-battery warning. - Malfunction & maintenance code.
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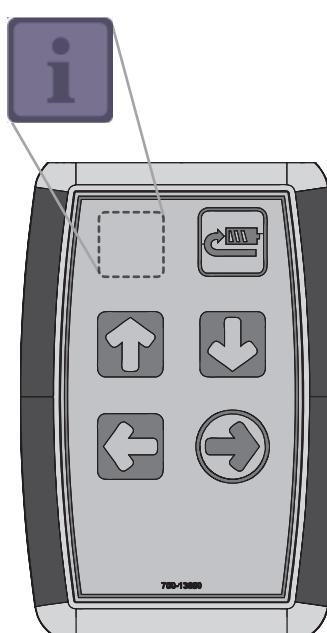
FULL FEATURE TEST

These tests will be performed after replacement of a part or a repair is performed to ensure the quality of the repair. The test will be called out throughout section 6.

# Item	Function	Activation/ Validation	Actions	Criteria for approval
1	Charging	Manual or button	Push R/L button or direct lift manually on a charging station	Activation of the charging station For ECS option, system shall charge when battery level is under 80%
2	Horizontal displacement	Buttons	Push right and left function on the hand control	No abnormal noise. Lift is moving along the rail in the expected direction.
3	Vertical displacement	Buttons	Push up and down function on the hand control	No abnormal noise. Spreader bar is moving up and down.
4	Inclined PDPS	Buttons	Push inclined or sitting position	No abnormal noise. Powered DPS is moving according to the wanted action.
5	High / Low limit switch	Buttons	Push up and down function on the hand control	High limit switch must activate at top of stroke. No abnormal noise. Low limit switch must activate at end of stroke. No tension limit must stop lowering action if there is no tension on strap (e.g. without accessories)
6	Hand control	Buttons	Press each button	All functions are working: no display issues.
7	Up / Down	Buttons	Press alternate buttons on lift	Strap is moving up and down

To perform a Full Feature Test on the MS2 Plus, refer to *Maxi Sky 2 Plus* document "Initial Start Up" 001-31229-EN section 14 "Testing the *Maxi Sky 2 Plus* System".

HAND CONTROL CONFIGURATION

Regular hand control			Infra-red hand control
	Without powered DPS	With powered DPS	
2 functions			Only available configuration for MS 2 Plus
4 functions			

Icon	Button description	2 functions	4 functions	Infra-red
	Up button	x	x	x
	Down button	x	x	x
	Right button		x	x
	Left button		x	x
	Reclined button	x(*)	x(*)	
	Sit button	x(*)	x(*)	
	RTC / RTH button		x	x
	Programming / information button	x	x	x (No label)

(*) With Powered DPS option

DISPLAY SYMBOLS

The following is a description of all the symbols that may be presented on the display.



Battery Charge Level

- Several symbols showing a battery at a different charge levels. These symbols indicate the status of the batteries and/or the regular charging system.



ECS Indicator

- On units equipped with ECS option, this symbol shows up when the batteries are charging, confirming that the ECS system is operational.



RTC (Return to Charge)

- This symbol indicates that the RTC function was activated by the hand control.



RTH (Return to Home)

- This symbol indicates that the RTH function was activated by the hand control.



PPP (Pre-Programmed Position)

- This symbol indicates that the PPP function was activated by the hand control



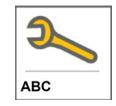
Over Duty Cycle

- This symbol flashes when the lift is used for a long period without allowing it to cool down. This security feature disables the function (Up, Sit/Reclined or Left/Right) that is being used beyond recommended duty cycle to prevent damage.
- When the overheat protection is engaged, the function, which exceeded the duty cycle, is disabled while all other functions remain active.
- The red light will stay on during a cooling period. In addition, a single beep will be heard.



General Malfunction (Warning symbol accompanied with a numeric character)

- This symbol flashes when the lift encounters a malfunction.
- The lift needs to be inspected / repaired by a qualified service technician.
- The red light will stay on and a single beep will be heard.



Maintenance Required (Wrench symbol accompanied with a letter character)

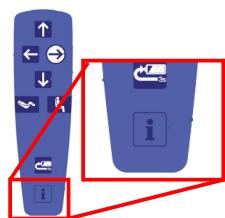
- This symbol is shown for 7 seconds (accompanied with 2 beeps) when the lift is waking up from sleep mode and flashes every 5 seconds to draw the user's attention.



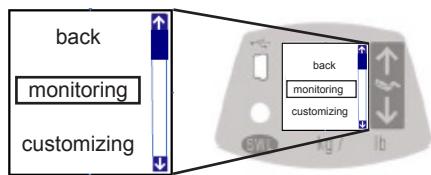
Overweight

- This symbol flashes when a transfer is attempted with a load exceeding the lift's capacity.
- The red light will stay on (accompanied with four rapid beeps) until the patient is lowered.
- The function is disabled while all other functions remain active.

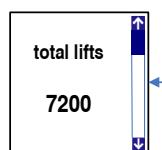
MONITORING



-Press on the info button  for 3 seconds to access the complete list of information.

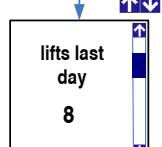


-Select monitoring menu and press  to confirm



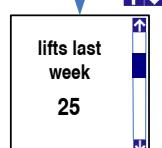
Total lifts made since the initial start up.

Note : A lift is determined as one raising, waiting time for the transfer and one lowering.



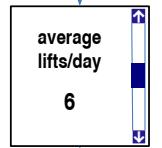
Number of lifts made during the last day.

Note: A day begins at midnight (12 am).

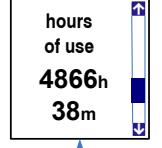


Number of lifts made during the last week.

Note: A week begins on Sunday.



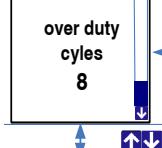
Average of lifts per day based on the last 7 days.



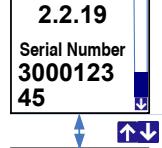
Hours of use since the initial start-up.



Number of times the safe working load was exceeded.



Number of times the duty cycle was exceeded.



Software version and Serial number of the device

Note: Available from software version 2.2.X

Return to previous menu.

For details about MS2 Plus “Monitoring Displayed Information” refer to MS2 Plus documents - IFU 001-31228-EN and 001-31249-EN.

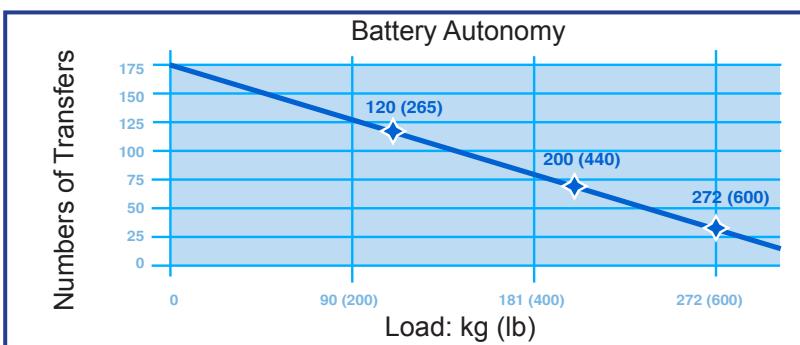
BATTERY INFORMATION

Display	Battery Charge	Remarks
	100%	Normal operating range
	75%	
	50%	
	25%	Low Accompanied with a short beep when one of the following button is pressed
	< 5%	Critical Icons alternate accompanied with a two short beep every 10 seconds

The batteries for this device are rechargeable lead acid batteries. For safe handling and to extend the battery lifetime, please follow and remember these instructions. Not following these instructions can cause short battery life and may, in extreme cases, put user at risk.

Battery life depends on many factors. These are: frequency of use, frequency of charging, temperature of operation, storage and storage time.

Using lead-acid batteries below 5% charge can damage the battery resulting in shorter battery life. The 5% charge is indicated by the critical battery level symbol flashing on the display. At this time, the lift will allow only the down function. Make sure to recharge the batteries as soon as possible.



This graph illustrates the relationship between the number of lifts that can be performed before reaching battery critical level, versus the load being lifted.

For information about MS2 Plus battery autonomy, refer to MS2 Plus IFU 001-31228-EN "Battery Information" section.

CHARGING THE BATTERIES

WARNING

DO NOT OPERATE THE CHARGING STATION WITH A DAMAGED CORD OR IF THE STATION HAS BEEN DROPPED OR DAMAGED. DO NOT BEND THE POWER CORD BY FORCE, OR PLACE A HEAVY OBJECT ON IT, SINCE IT COULD DAMAGE THE CORD AND MAY CAUSE FIRE OR ELECTRICAL SHOCK.

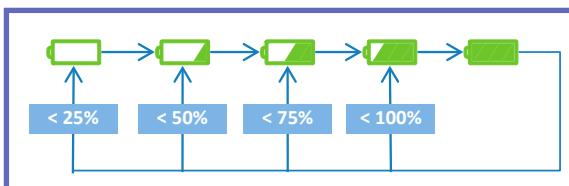
NOTE

THE LIFT CAN BE OPERATED AT ANY TIME DURING THE BATTERIES' CHARGING, WHICH WILL STOP AUTOMATICALLY.

Regular Charging System

2-function model: Move the lift under the charging station.

4-function model: Press the and buttons or the button to bring the lift to the charging station.

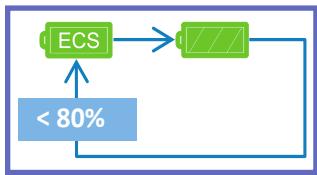


Check the LED to confirm that the batteries are charging properly.

- The LED will flash green until batteries are fully charged.
- The display will cycle through charge level icons according to actual battery charge level to show the charging progress.

If the batteries have been completely drained it could take up to 8 hours to completely recharge them.

ECS Charging System



System equipped with ECS will display the  icon when batteries are charging.

- The LED will flash green for a fixed period of 8 hours. After that period, the device will launch another 8 hour charging period if the batteries are still below 80%. Otherwise, the LED will become solid.

If a function is activated during the charging process, the ECS icon will disappear and the green LED will become solid. After the function button is released, the device will attempt to reconnect to the ECS system after approximately 20 seconds only if the battery charge level is still below 80%.

If the ECS system is not supplying voltage due to a system fault or power failure, the display will show actual battery level as for a non ECS system. The device will attempt to reconnect to the ECS system every 15 minutes after the fault being detected. The device will attempt to reconnect to the ECS system only if the battery charge level is below 80%.

MS2 Plus battery charging operates in the very same manner as MS2, both in Regular or ECS mode.

RISK ASSESSMENT CHECKLIST FOR TECHNICIANS

WARNING

IF IN DOUBT, CONTACT YOUR LOCAL ARJOHUNTLEIGH
REPRESENTATIVE. DO NOT TAKE UNNECESSARY RISKS

The following assessments MUST be done before carrying out service, repair works or installations:

- Immediately stop.
- Make sure the work area is adequately sized, suitably lit and at a reasonable temperature.
- Use safe work and handling practices to keep risks of injury to a minimum.
- Tools and equipment must be kept in good condition.
- Wear protective clothing, shoes and eye protection when necessary.
- When you are handling an electronic component of the *Maxi Sky 2* you must be ESD protected.
- You should be adequately trained to perform a task.
- Do not manually lift items that could cause personal injuries and that are too heavy, hot or sharp.
- You must comply with all local site safety rules, report any incidents or accidents to the site safety supervisor or equivalent. Use the ArjoHuntleigh reporting procedure.
- Load tests must only be done as instructed in the relevant procedures.
- If it is necessary to work from a platform (i.e. scaffold, ladders, etc.) to perform a service or installation task make sure the platform is secure and suitable for the task.

DANGER

SHUT OFF THE POWER BEFORE SERVICING BY PULLING
ON THE RED EMERGENCY STOP CORD

- Do not perform maintenance tasks on equipment with "live" electrical connections unless it is absolutely necessary.
- Isolate the power supply before removing plugs, sockets or disconnected cables.
- Be alert at all times to the dangers of working on electrical equipment that operates on mains supply voltage.
Where possible, visually inspect electrical cables, plugs, etc. for damage or deterioration before working on equipment.
- Dispose of all waste in appropriate containers, in compliance with local legislation.

SUGGESTED TOOLS

- Standard tool kit
- Torx T20 screwdriver
- Extractor Pin (P/N: 005.00374)
- Extractor Pin Amp (P/N: 001.00001)
- Extractor Pin Amp Mini (P/N: 001.00002)

RECOMMENDED SPARES

For *Maxi Sky 2* - refer to the *PARTS LIST 001-15699-EN*

For *Maxi Sky 2 Plus* - refer to the *PARTS LIST 001-31230-EN*

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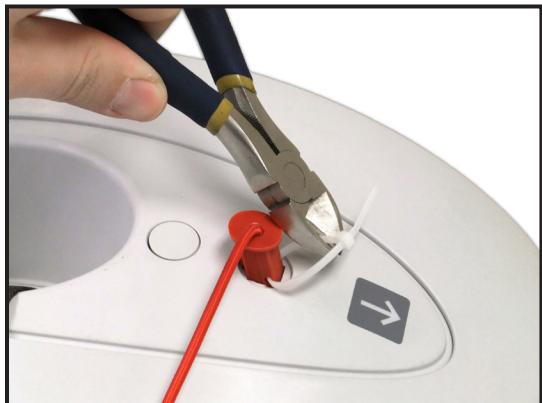
INITIAL STARTUP

5

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ADJUSTMENT OF THE CURRENT LIMITER ON MS2	5
ADJUSTING CURENT LIMITER ON MS2 PLUS	6

INITIAL START-UP PROCEDURE

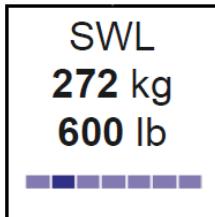
For MS2 Plus Initial Start Up, refer to MS2 Plus 001-31229-EN.



- Cut the tie wrap around the red button.
- Install Hand control (Refer to "REMOVING THE UP/DOWN MOTOR" on page 52).



- Turn the lift ON by pushing on the red button.



- Make sure to have the right SWL. Compare the data displayed on the LCD screen with the SWL sticker on the lift.

ADJUSTING DATE AND TIME

When the lift is started for the first time, follow the next steps.



Increase value



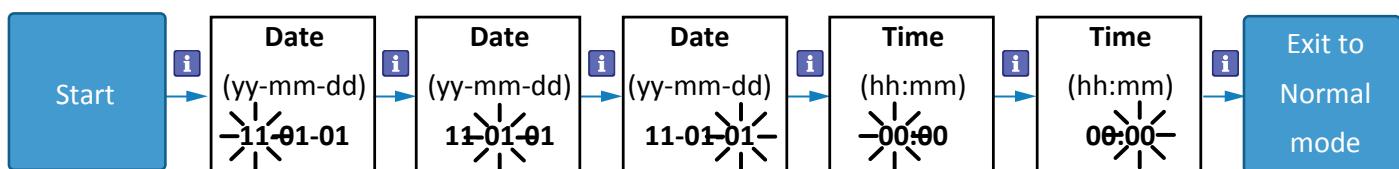
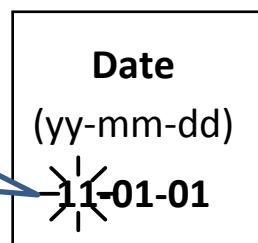
Enter value /
Go to next parameter



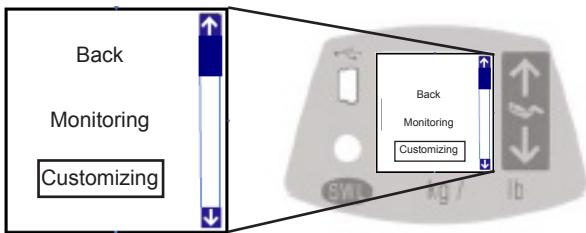
Decrease value

Adjust date and time by using the Up and Down button, press to confirm value

Blinking digits
showing selected
parameter



CUSTOMIZING



- To access the Customizing section, press and hold the  button for 3 seconds.
- Select “customizing” then press  to confirm.
- Press Up/Down button to scroll through the Customizing menu.
- Press  button to enter and accept value.

Parameters available in the customizing menu

Parameter	Description	Settings (default in bold character)
Motor speed	Displacement speed along the rail	10 cm/s (4 in/s) 15 cm/s (6 in/s) 20 cm/s (8 in/s)
RTC/RTH function	RTC/RTH options	Disable , auto,  ,  If RTC/RTH function is set at auto, you need to bring the unit to the charging station, so the lift will recognize its location. For software version 2.0 and 2.1, each time the lift is turned off, it forgets the charging station location. When you turn the lift back on, you need to bring it back to the charging station. For software versions 2.2 and up, even if the lift is turned off, it will remember the charging station's location.
PPP function	Enabling / Disabling PPP	Disable , enable
Strap length	RTC/RTH mode strap unwinding duration	1 to 30 sec. (1 sec.) for software version 2.0.X and 2.1.X 13 to 152 cm (5 to 60 in) from software version 2.2.X Has no effect when RTC/RTH is disabled
Detection time	Maximum time allowed finding Charger or PPP station	0,5 to 5 min. (1.5 min.) Has no effect when both RTC/RTH and PPP functions are disabled
Ready state	Lift standby duration before entering sleep mode	1 to 20 min. (10.5 min.)
Hoist led	Enabling / Disabling green LED	Disable , enable
Date/time	Actual date/time	Depends on value Set at initial start-up (11-01-01 00:00)
Dual / Single mode (only for MS2 Plus)	Switching Between Modes	Dual / Single
Back	Exit Customizing Mode	

For MS2 Plus the customizing is done on the leading ceiling lift and by doing so the parameters will be set in both the leading and driven ceiling lifts. For example, if the *Ready state* setting is changed from 10.5 to 15 minutes, both ceiling lifts will adopt the changes simultaneously.

Also, parameters *Motor Speed*, *RTC/RTH*, *PPP* functions and *Detection Time* are found in the menu, customizing them will have no impact since these functionalities have been disabled within the *Maxi Sky 2 Plus*.

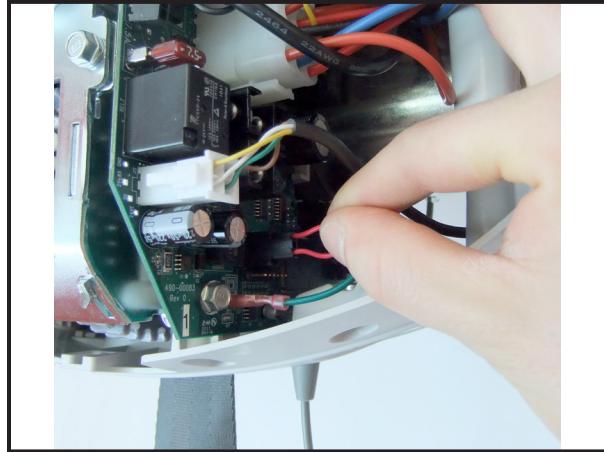
MODIFICATION OF THE SAFE WORKING LOAD (SWL)

**DANGER**

SHUT OFF THE POWER BEFORE SERVICING BY PULLING ON THE RED EMERGENCY STOP CORD



-Unclip the bottom cover.



-Install proper jumper to have the appropriate SWL.

NOTE

- NO JUMPER EQUALS TO 265 LB (120 KG)
- ORANGE JUMPER EQUALS TO 440 LB (200 KG)
- RED JUMPER EQUALS TO 600 LB (272 KG) **BY DEFAULT**

WARNING

BEFORE INCREASING THE SAFE WORKING LOAD, MAKE SURE THAT THE RAIL INSTALLATION IS RATED TO SUPPORT THE SAFE WORKING LOAD OF THIS LIFT.
FAILURE TO FOLLOW THIS INSTRUCTION MAY RESULT IN INJURY TO YOU OR TO OTHERS



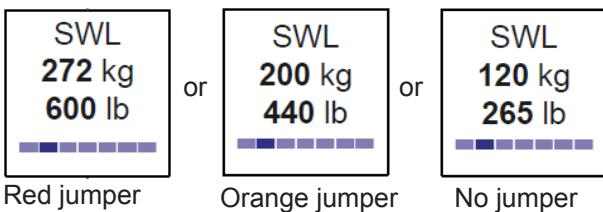
-Install proper sticker for the related SWL.



-Mount and clip bottom cover.



-Turn the lift ON by pushing on the red button .



-Verify if the display is showing the right SWL (Safe Working Load).

NOTE

IT IS POSSIBLE TO ADJUST THE VALUE OF THE CURRENT LIMITER FOR THE OVERWEIGHT DETECTION.
THIS PARAMETER INCREASES THE LIFTING CAPACITY BEFORE TO TRIGGERING THE OVERWEIGHT SIGNAL



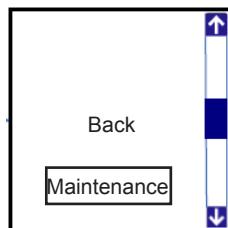
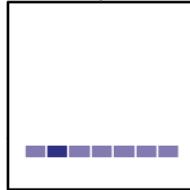
WARNING

THIS VALUE SHOULD ONLY BE MODIFIED IN ACCORDANCE
WITH THE WEIGHT LOAD TEST OF THE LIFT.

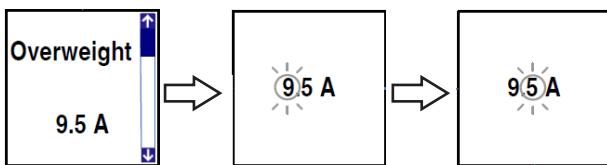
-Shut OFF the Power by pulling on the red emergency stop cord.



- Turn the lift ON by pushing on the red button.
- When the loading display appears on the screen, press **↑ + ↑ + i** on the hand control.



- Select Maintenance and press the **i** button



- Select Overweight and press the **i** button.
- Adjust the value with the Up/Down button and confirm with the **i** button.

NOTE

EACH LIFT IS PRESET IN MANUFACTURING SITE AND THESE VALUE MAY DIFFER FROM THE TYPICAL VALUE

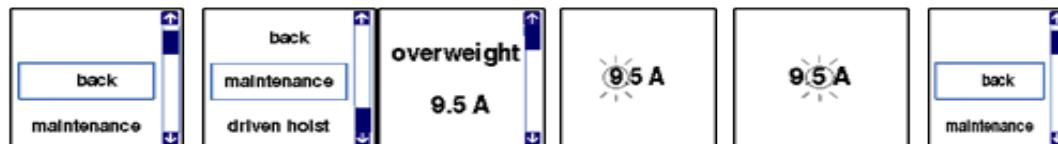
Typical value for the Up/Down motor current limiter:

SWL	Typical Current
272 kg (600 lb)	13.4 A
200 kg (440 lb)	10.0 A
120 kg (265 lb)	6.5 A

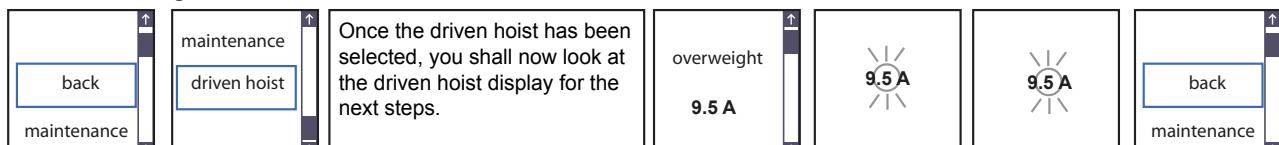
ADJUSTING CURRENT LIMITER ON MS2 PLUS

Adjusting the current limiter of the ceiling lift on MS2 Plus is done in a similar manner as for MS2. First access the maintenance menu as explained in previous page.

For Leading Ceiling Lift



For Driven Ceiling Lift



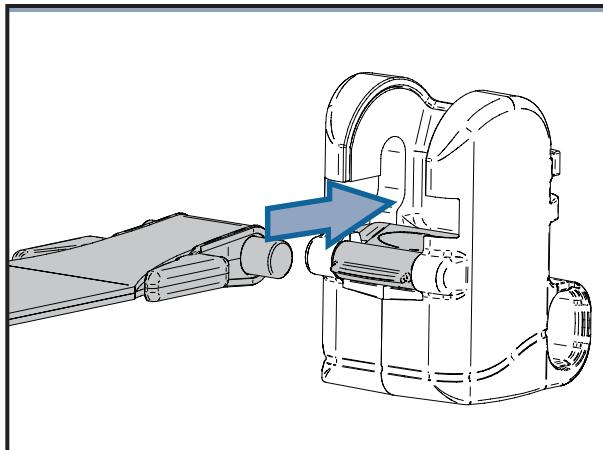
INSTALLATION AND REPLACEMENT PROCEDURE

6

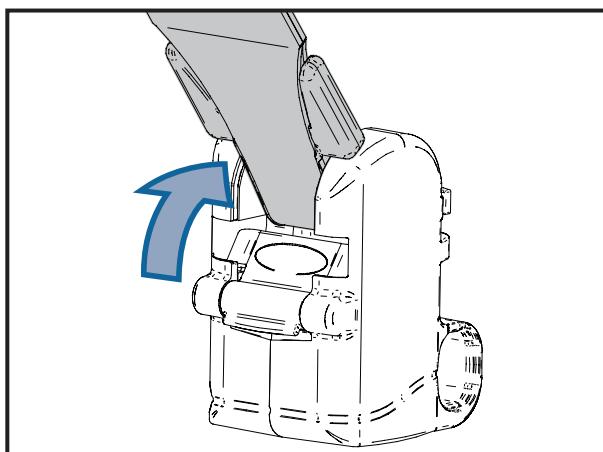
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REPLACEMENT OF THE MS2P CONTACT BLADES	65
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Note: any parts replacement or repair on the MS2 Plus ceiling lift shall be followed up by a full product testing according to 001-31229-EN section 14 "Testing the *Maxi Sky 2 Plus System*".

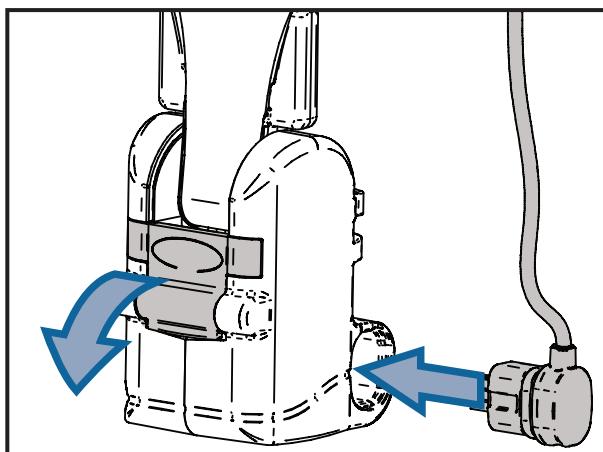
ACCESSORIES INSTALLATION



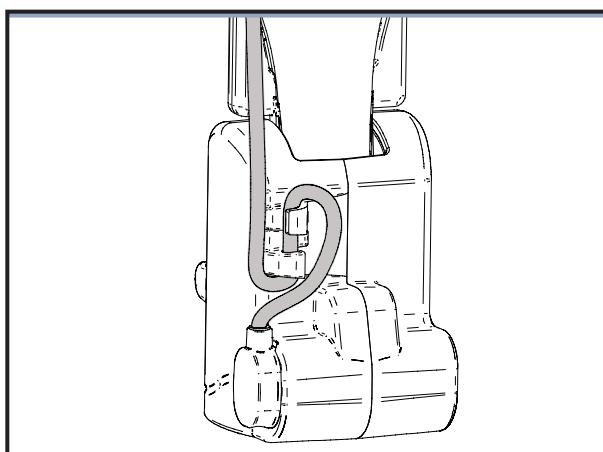
-Insert the strap with the pivot into the quick connect by pushing it inward.



-Rotate the strap upward.

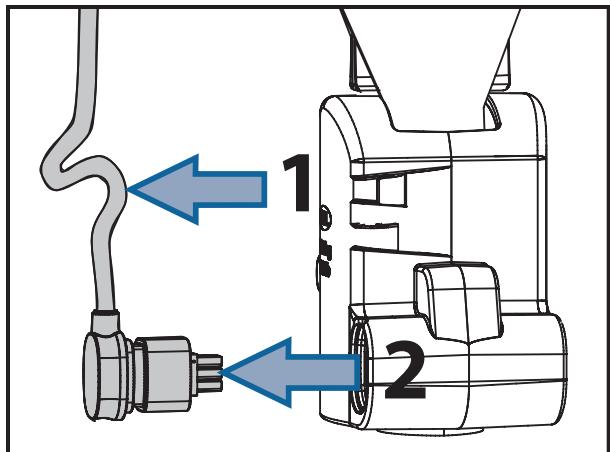


-Ensure that the latch is closed.
If using a PDPS, connect the cable.

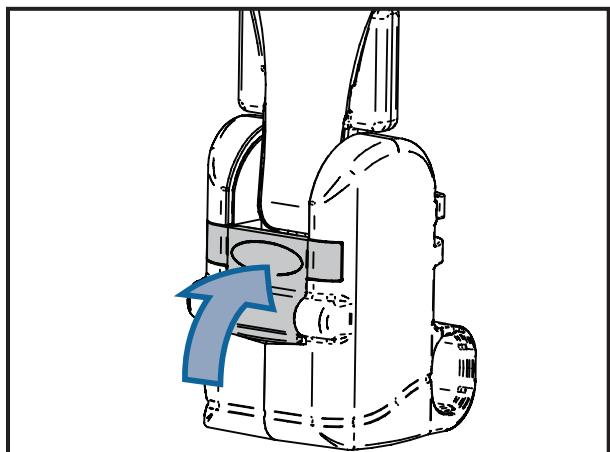


-If using a PDPS, secure the cables on the back of the quick connect as shown.

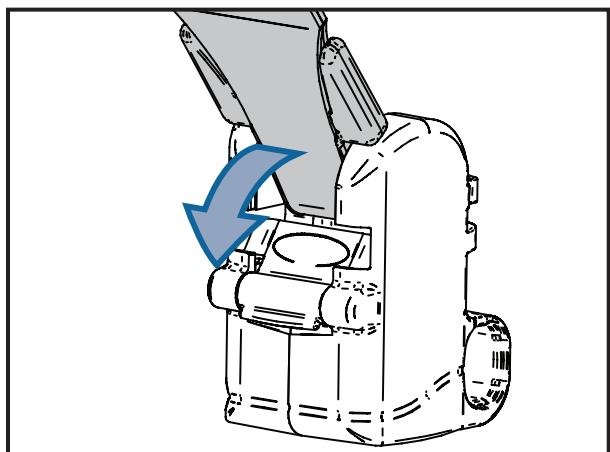
ACCESSORIES UNINSTALLATION



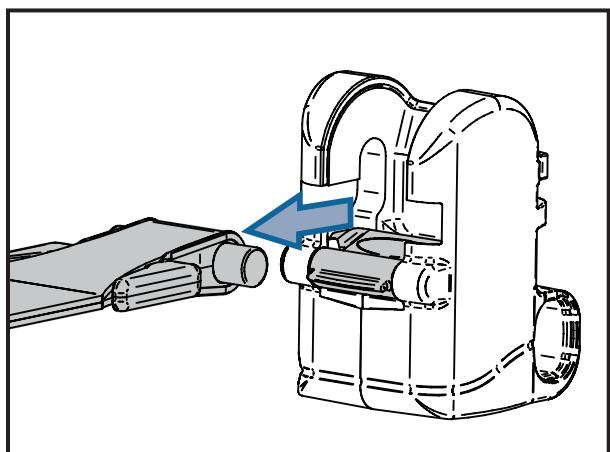
-If using a PDPS, detach the cable from the back of the housing and then disconnect the connector.



-Open the latch that locks the strap in place by pushing it inward.

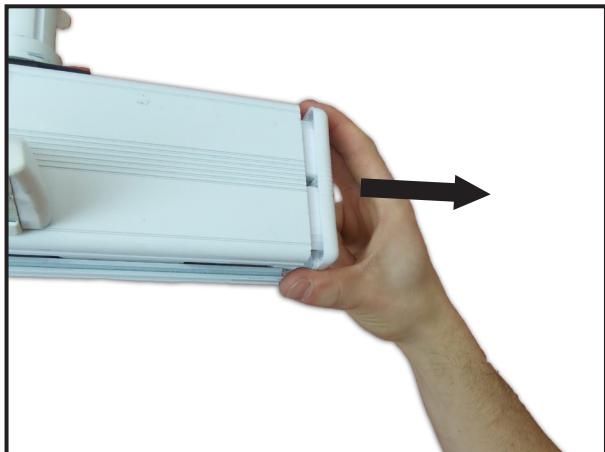


-Rotate the strap towards the latch.

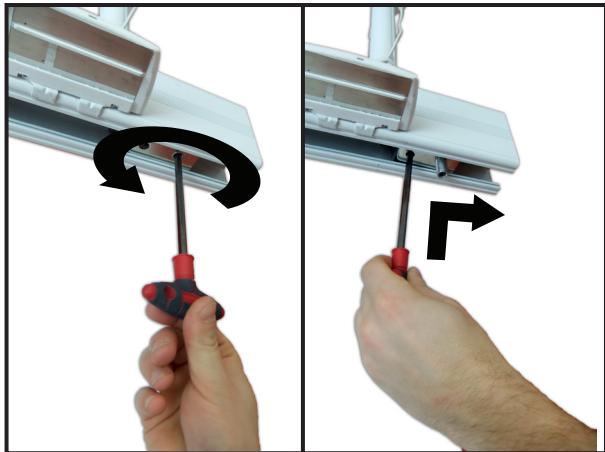


-Pull the strap out of the attachment.

REMOVING THE LIFT FROM THE RAIL



-Remove plastic cap at the end of the rail.



-Unscrew end stopper on the rail using a 6mm allen key.
-Press inside the hole to remove the end stopper.



-Remove lift from the rail.



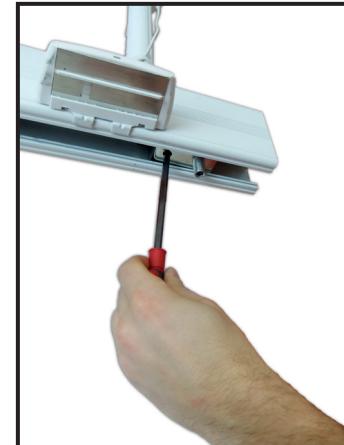
INSTALLING THE LIFT ON THE RAIL



-Insert the lift into the rail.



-Install lift on the rail and make sure to align the ECS trolley, if applicable.



-Place the end stopper into the rail
-Screw the stopper on the rail using a 6mm allen key and torque to 20Nm (15 lb ft)



-Place a plastic cap at the end of the rail.

WARNING

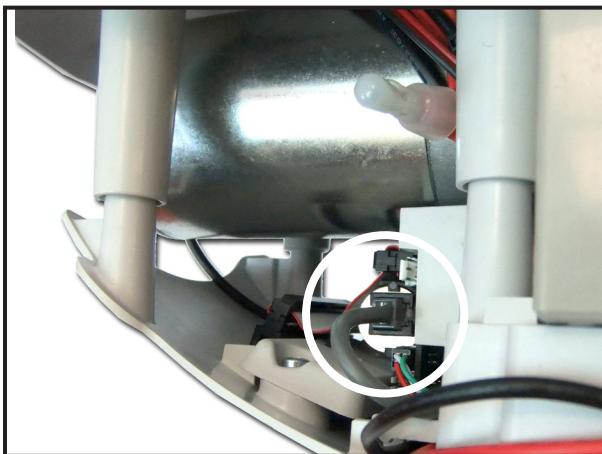
MAKE SURE THE END STOPPERS ARE CORRECTLY INSTALLED AND TIGHTENED AT ALL RAIL ENDS.

WIRED HAND CONTROL REMOVAL

**DANGER**

SHUT OFF THE POWER BEFORE SERVICING BY PULLING ON THE RED EMERGENCY STOP CORD.

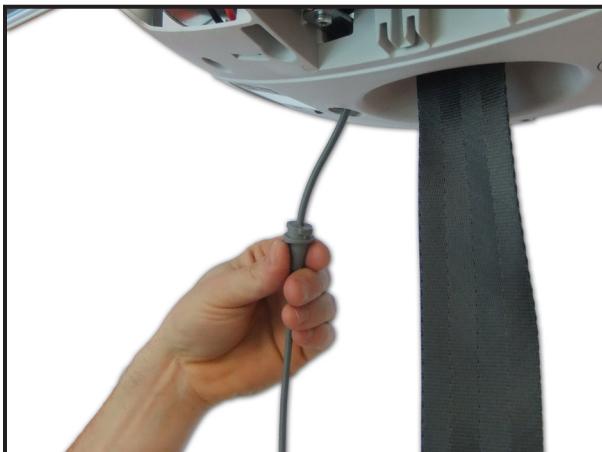
-Unclip the bottom cover.



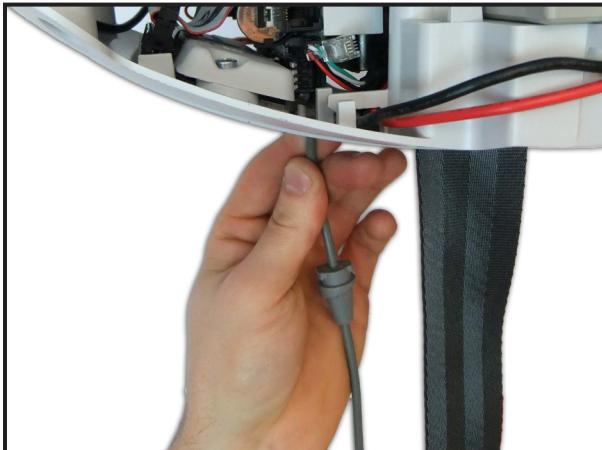
-Disconnect the telephone jack of the hand control on the main PCB.



-Turn the grommet a $\frac{1}{4}$ turn counterclockwise to disengage the cable grommet.



-Pull the cable out of the bottom cover.



-Make sure that the telephone jack at the end of the cable passes freely through the plastic part.

NOTE

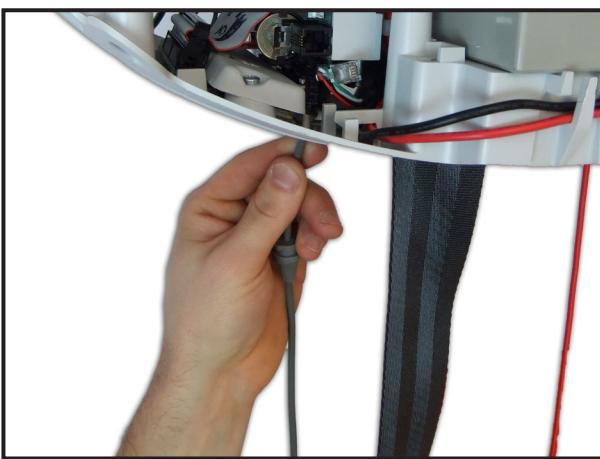
DISPOSE OF THE OLD PARTS ACCORDING TO LOCAL REGULATIONS GOOD ENVIRONMENTAL PRACTICES.

WIRED HAND CONTROL INSTALLATION

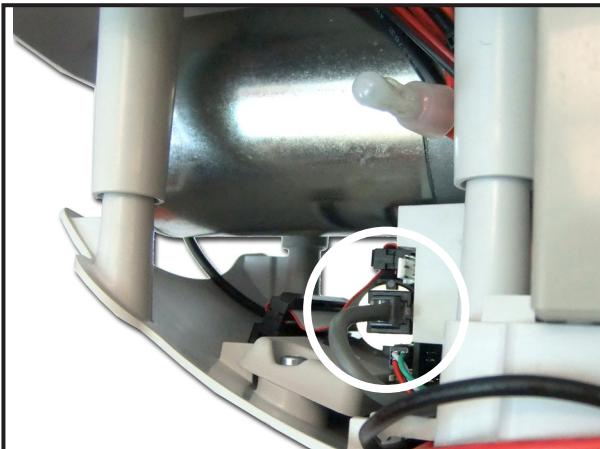
**DANGER**

SHUT OFF THE POWER BEFORE SERVICING
BY PULLING ON THE RED EMERGENCY STOP CORD.

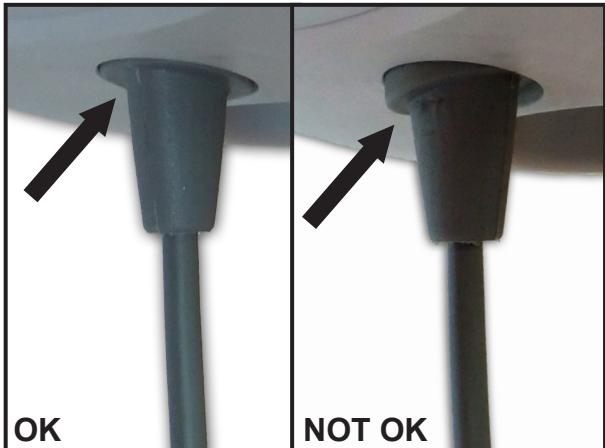
-Unclip the bottom cover.



-Take the hand control.
-Insert the telephone jack first.



-Connect telephone jack into the main PCB

**NOTE**

MAKE SURE TO INSERT CABLE GROMMET ON THE
RIGHT SIDE (ONLY ONE POSITION IS POSSIBLE IN THIS AS-
SEMBLY).

-Turn the grommet a 1/4 turn clockwise to secure the hand control.



-Mount and clip the bottom cover.



-Turn the lift ON by pushing on the red button and perform a functional test (refer to "FULL FEATURE TEST", page 4-4 item 6 for procedure).

INFRA-RED (IR) HAND CONTROL INSTALLATION

NOTE

EACH IR HAND CONTROL MUST BE SET AT THE SAME CHANNEL AS THE LIFT. IF YOU HAVE MORE THAN ONE LIFT WITH IR CONTROL, ENSURE THAT THEY ARE SET TO DIFFERENT CHANNELS. HAND CONTROLS ARE SET TO CHANNEL 1 BY DEFAULT.



Note: INFRA-RED hand control is not compatible with MS2 Plus. Any attempt to use it will lead to a non functional device.

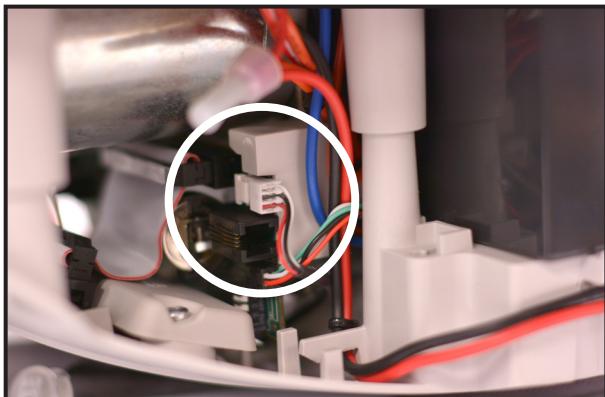
DANGER

SHUT OFF THE POWER BEFORE SERVICING BY PULLING ON THE RED EMERGENCY STOP CORD.

- Unclip the bottom cover.
- If necessary, remove the previous hand control.



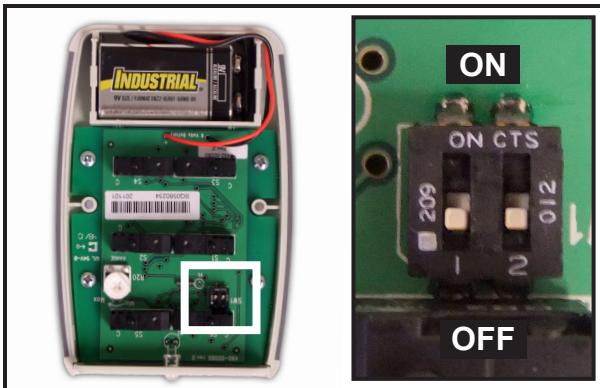
- Take an IR hand control cable assembly.
- Insert connector first through the strap inlet beside LCD screen.
- Press and clip the sensor to the strap inlet.



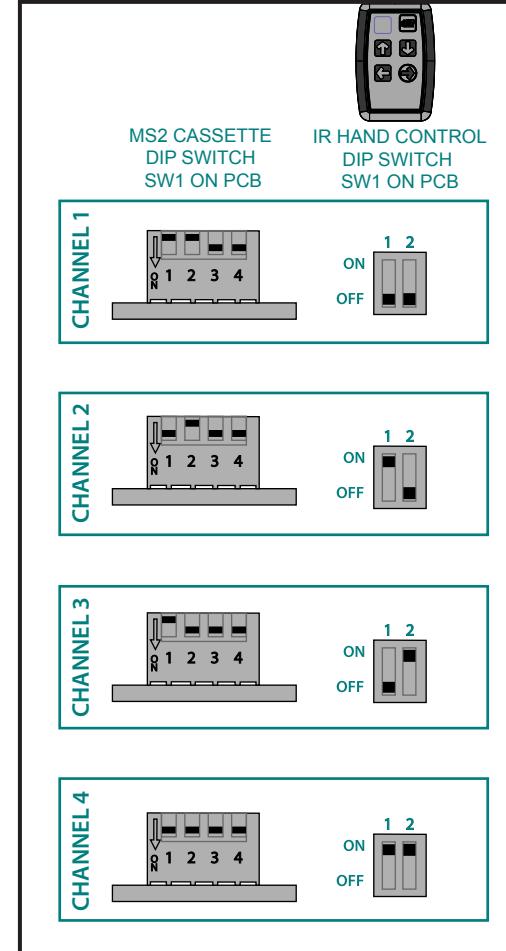
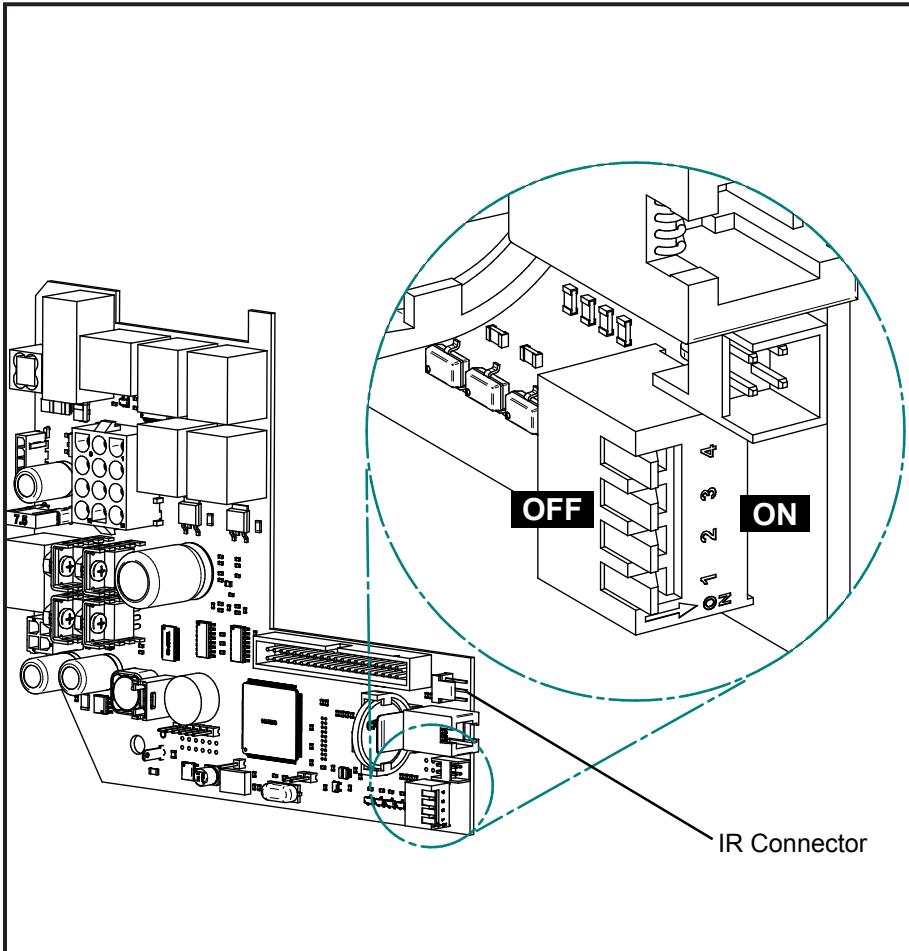
- Connect the white connector (3 pins connector) to the main board, (refer to "WIRED HAND CONTROL REMOVAL", page 6-6, figure of the PCB for the connector location).
- Set the IR address of the lift to the desired channel, according to the table on the next page.



- To set hand control channel, remove bottom cover of the IR Hand control.



- Set the IR hand control address to the same channel selected for the lift, according to the table below.
- Close the rear cover of the IR hand control



-Mount and clip the bottom cover



-Turn the lift ON by pushing on the red button and perform a functional test (refer to "FULL FEATURE TEST", page 4-4, item 6 for procedure).

NOTE

FOR MORE DETAILS ON THE IR HAND CONTROL, REFER TO THE "IR HANDSET TECHNICAL MANUAL (001-14601-EN)".

Adjusting the Maximum range

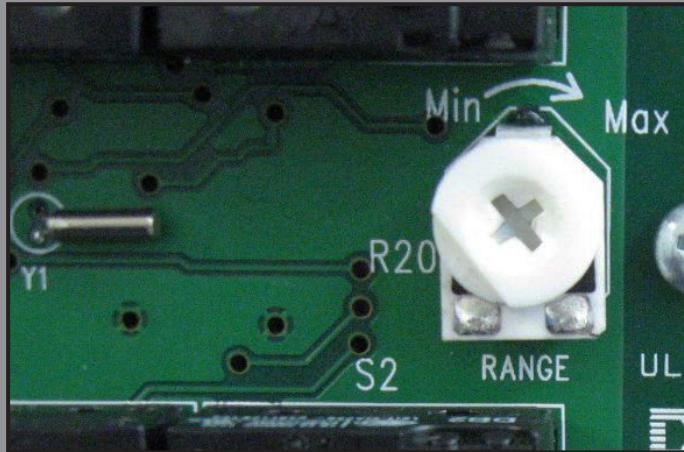
The range allows an adjustable detection distance from minimum to maximum.

NOTE

THE BATTERY LIFE IS REDUCED SIGNIFICANTLY WHEN RANGE IS ADJUSTED TO "MAX". MAXIMUM RANGE WILL BE REDUCED AS THE LEVEL OF THE BATTERY'S CHARGE (VOLTAGE) DECREASES.

NOTE

THE MAXIMUM RANGE OF THE HANDSET IS AFFECTED BY THE ANGLE OF USE. RANGE MAY DECREASE WHEN USED AT ANGLE OF OVER 45°.



- Remove the bottom cover of the IR hand control.
- Turn the potentiometer (R20) clockwise to increase the maximum range or counter clockwise to decrease the maximum range.
- Close the rear cover of the IR hand control.

CAUTION

MAKE SURE NOT TO PINCH OR DAMAGE THE BATTERY'S WIRES WHEN REASSEMBLING THE HAND CONTROL.

STRAP CHANGE

TO REMOVE ACCESSORIES, REFER TO "ACCESSORIES UNINSTALLATION", page 6-3



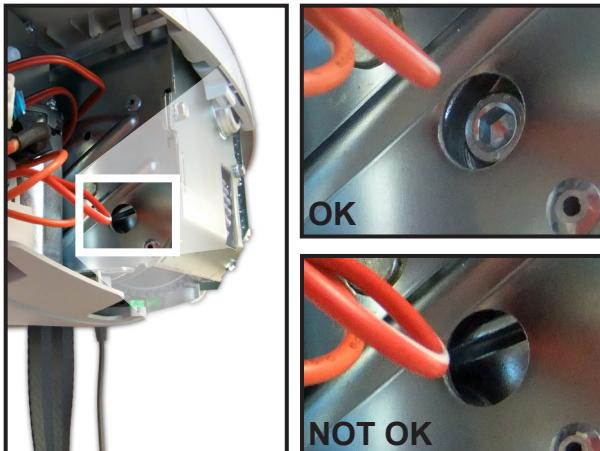
- The strap exchanger is a tool needed to perform the strap change.
- It is supplied with the new strap.



- Unclip the bottom cover
- Completely unwind the strap using the down button on the hand control.
- The lift must stop when low limit is reached.

NOTE

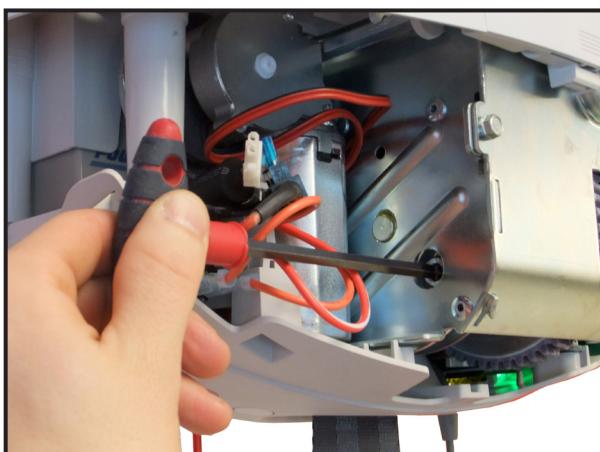
TO LOWER THE STRAP, THE MECHANISM NEEDS TENSION.
KEEP TENSION ON THE STRAP TO ALLOW IT TO UNWIND.



- With the up button, adjust the position of the drum to see the M8 screw.

DANGER

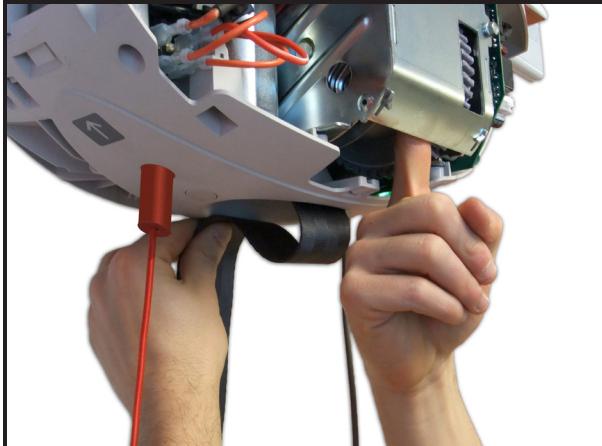
SHUT OFF THE POWER BEFORE SERVICING BY PULLING
ON THE RED EMERGENCY STOP CORD



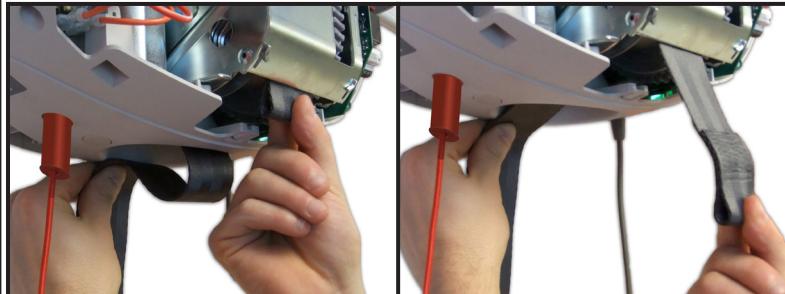
- Unscrew the M8 screw with a 6mm Allen key, but do not remove it completely.

NOTE

MAKE SURE TO KEEP THE STRAP WITHIN THE ASSEMBLY.
NOT DOING THIS WILL INCREASE THE COMPLEXITY OF THE
PROCEDURE BECAUSE THE LIMIT KIT NEEDS TO BE RE-
MOVED TO IN ORDER TO REPLACE THE STRAP CORRECTLY.



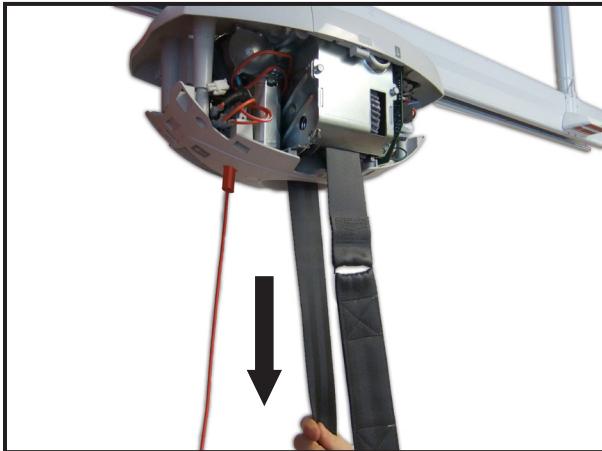
- Remove weight of the strap by holding the strap.
- Remove the M8 screw.
- With one finger or with a tool, pull down on the strap.
- Pull out the strap about 30 cm (12 in).



- Attach the strap exchanger to the old strap with a tie wrap.

NOTE

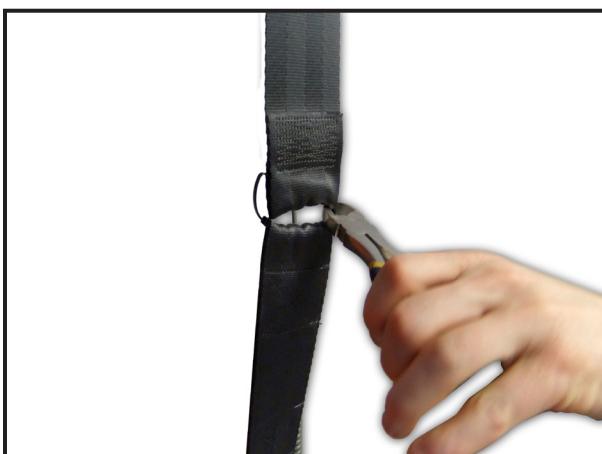
THE TIE WRAP'S CLIP MUST BE INSIDE THE STRAP LOOP.
THIS HELPS TO PASS THE STRAP INSIDE THE LIMIT KIT ASSEMBLY.



- Pull on the old strap until the strap exchanger passes through the lift.

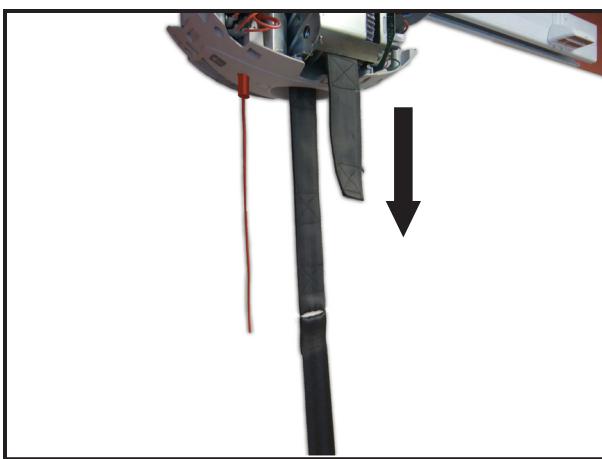
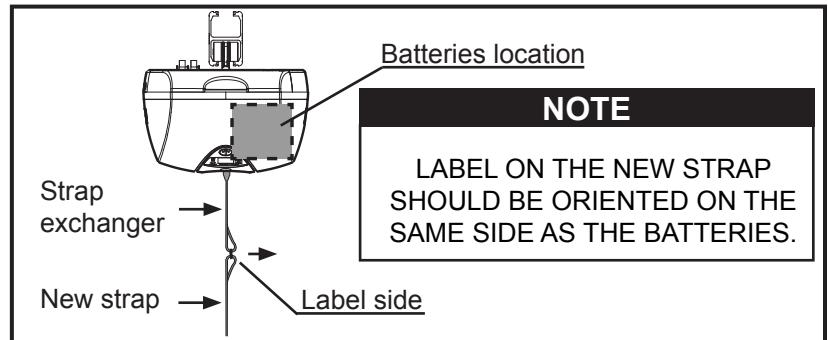


- Using cutters, remove the tie wrap and the old strap.
- Dispose of the old strap adequately.

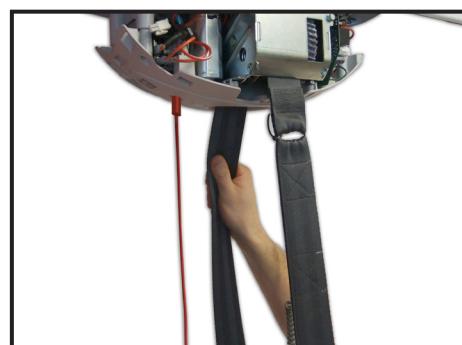




-Attach the new strap to the strap exchanger with a tie wrap.



-Pull on the strap exchanger until the new strap has passed through the lift.

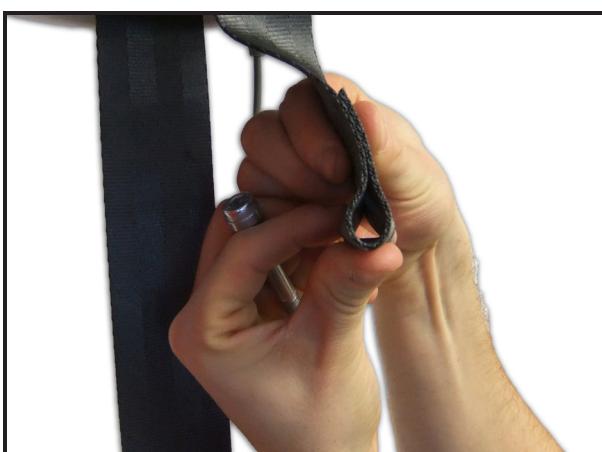


NOTE

IT MAY BE DIFFICULT TO
PASS THE NEW STRAP.
BACK AND FORTH MO-
TION MAY HELP.



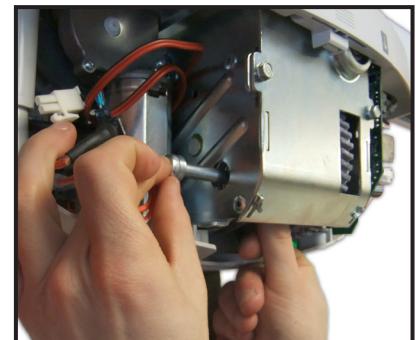
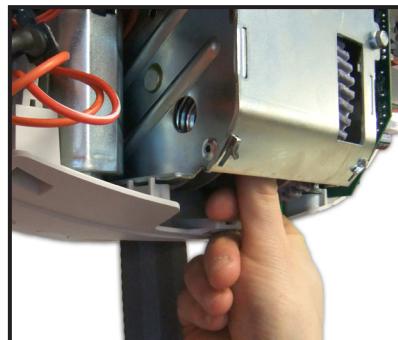
-Using cutters, remove the tie wrap and the strap exchanger.



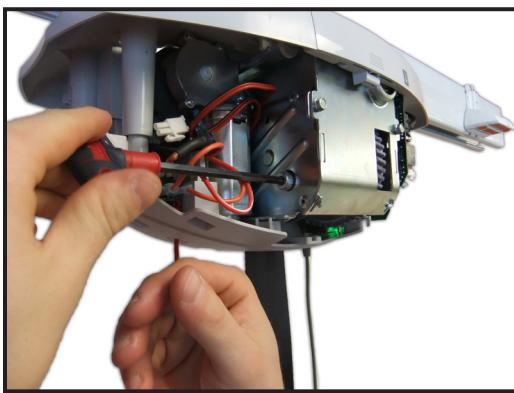
-Push at the end of the new strap to increase flexibility. This step helps to insert strap bolt into the strap opening.



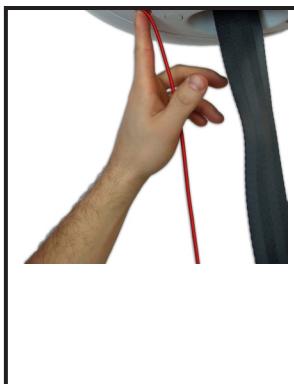
- Maintain strap on the other side to avoid losing the strap.
- Align the strap opening with the frame hole.
- Insert M8 screw through the strap into the frame and the drum.



- Tighten the M8 screw.



- Mount and clip the bottom cover.



- Turn the lift ON by pushing on the red button and perform a functional test (refer to "FULL FEATURE TEST", page 4-4 - Item 5 for procedure).

REFER TO "ACCESSORIES INSTALLATION", PAGE 6-2

WARNING

FOR THE MS2 PLUS CEILING LIFTS, ENSURE THE DEVICE IS IN DUAL MODE AND BRING BOTH STRAPS TO THE HIGH LIMIT. THIS WILL RESET THE STRAP LENGTH MONITORS TO ZERO. THE STRAP LENGTH MONITOR MAKES THE ACCURATE TRAVEL LIMITATIONS OF (+/- 350 MM) POSSIBLE FOR THE FOOT-END SPREADER BAR ABOVE AND BELOW THE HEAD-END SPREADER BAR.

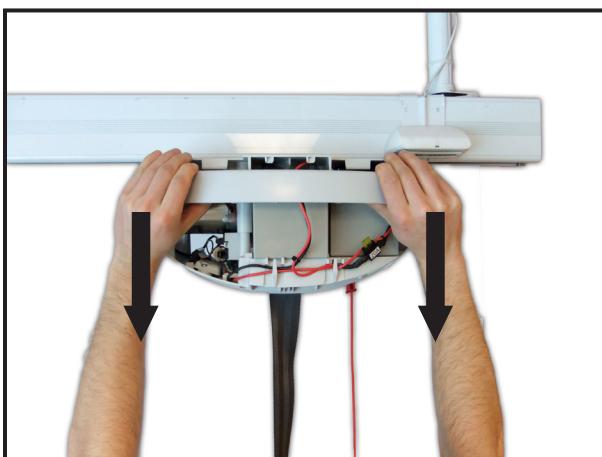
REMOVING THE BATTERIES



DANGER

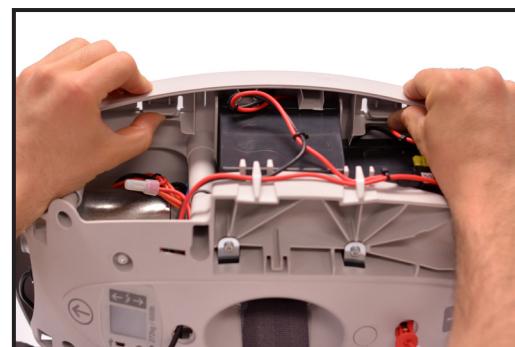
SHUT OFF THE POWER BEFORE SERVICING BY PULLING ON THE RED EMERGENCY STOP CORD

-Unclip the bottom cover.

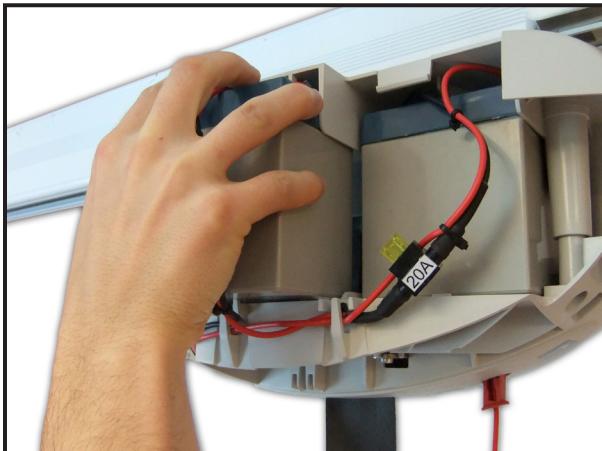


-Remove Battery door to access batteries.

-Slide downward by pulling on plastic tab inside the battery door.



-Remove the two batteries.



-Disconnect the cables from the battery.

-Dispose of the batteries.

NOTE

DISPOSE OF THE OLD PARTS ACCORDING TO LOCAL REGULATIONS GOOD ENVIRONMENTAL PRACTICES.



INSTALLING THE BATTERIES

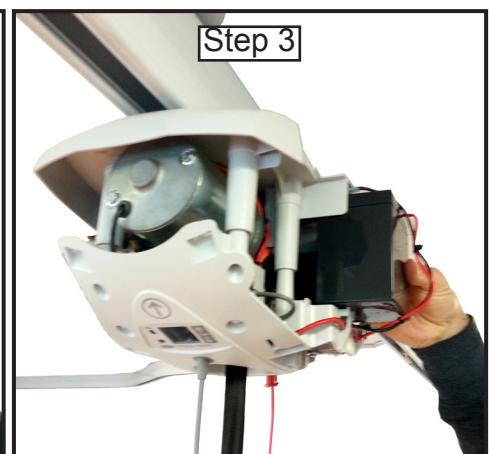
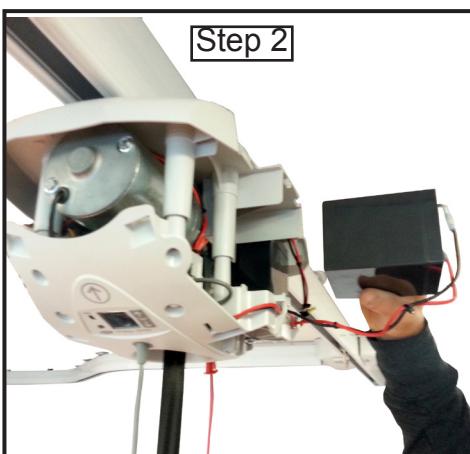
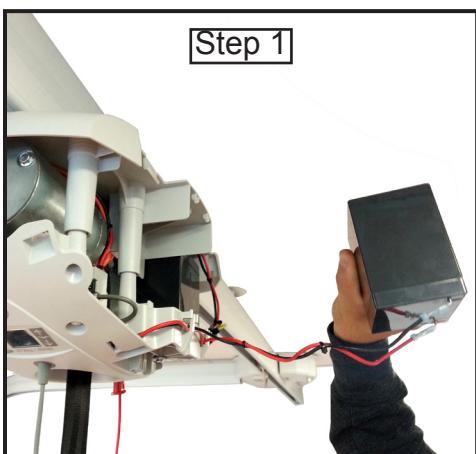


- Connect wire harness to the battery poles.
- Repeat this operation for the second battery.

NOTE

- POSITIVE POLE (+) IS RED
- NEGATIVE POLE (-) IS BLACK

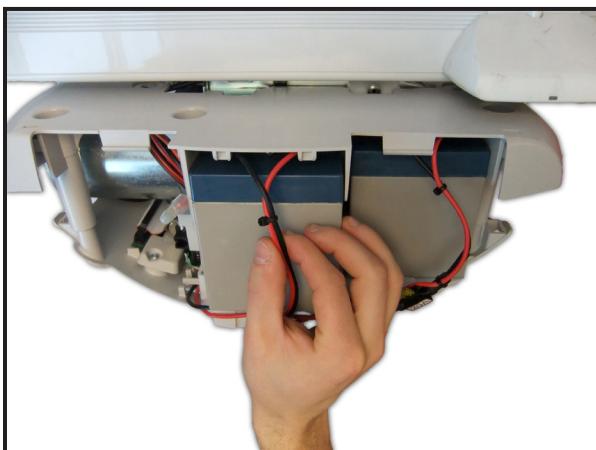
- Insert batteries into the lift. The following three steps may help to insert the batteries without twisting the wires.



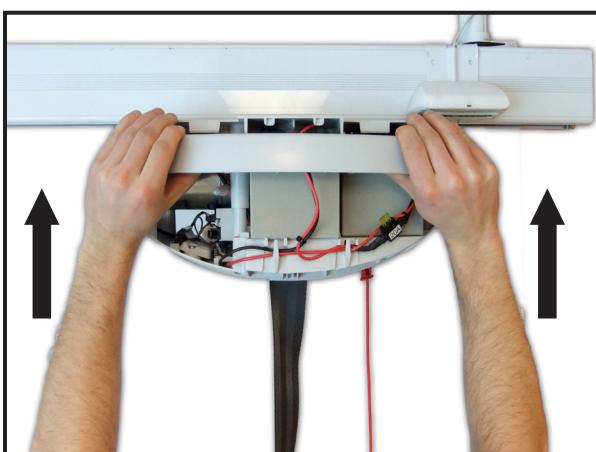
- Make sure to place wire harness in the middle of the battery door.

NOTE

- IT CAN TAKE UP TO 8 HOURS TO RECHARGE NEW BATTERIES.



- Mount and clip battery door.
- Mount and clip bottom cover.



- Turn on the lift and perform a functional test (refer to "FULL FEATURE TEST", page 4-4 - Item 1 for procedure)

REMOVING THE POWERED DPS

**DANGER**

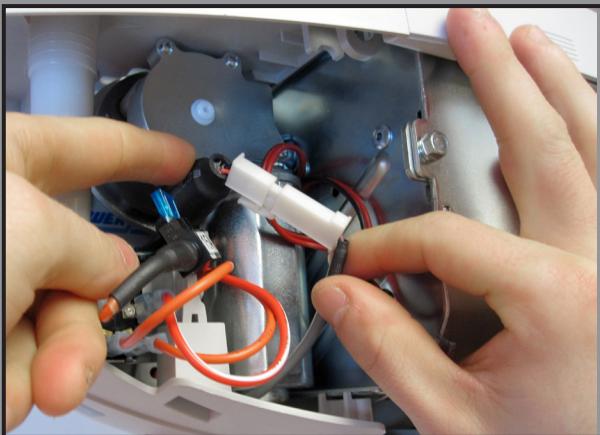
SHUT OFF THE POWER BEFORE SERVICING BY PULLING ON THE RED EMERGENCY STOP CORD.

REFER TO "ACCESSORIES INSTALLATION", PAGE 6-2

-Unclip the Bottom cover.

NOTE

REMOVING THE BATTERIES MAY HELP TO ACCESS THE PDPS CONNECTOR. IF NEEDED, REFER TO "REMOVING THE BATTERIES", PAGE 6-17.



-Disconnect the Powered DPS cable from the 2 pin connector.



-Turn the grommet a 1/4 turn counterclockwise to disengage the cable grommet.



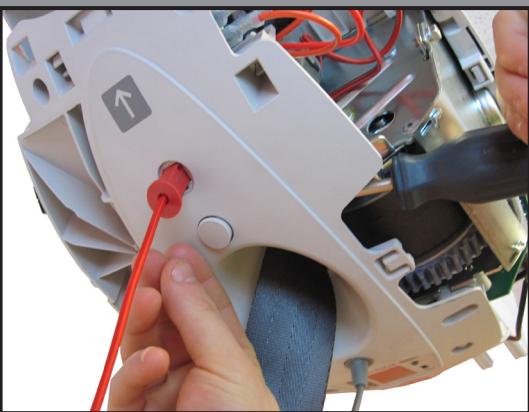
-Remove the PDPS cable.

OPTIONAL STEPS IF YOU REPLACE AN EXISTING PDPS

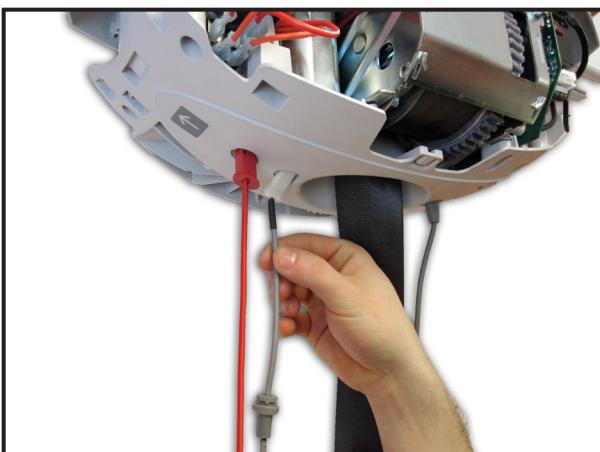
INSTALLING THE POWERED DPS

For MS2 Plus, Power DPS cable shall be installed on the leading ceiling lift.

OPTIONAL STEP IF YOU INSTALL A NEW POWERED PDPS

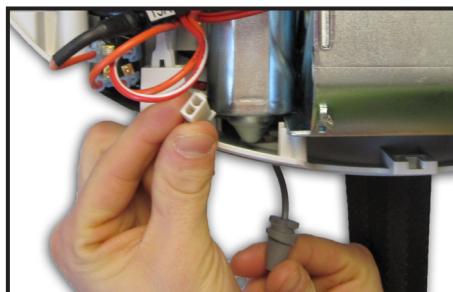


-Remove the plastic cap using a screwdriver by pushing it from the inside of the lift.

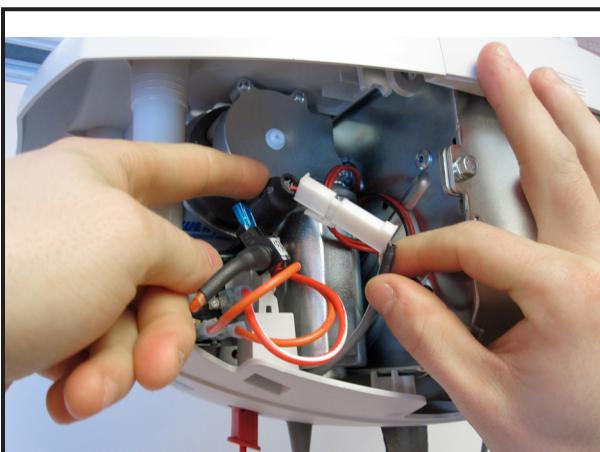


NOTE

DON'T FORGET TO PASS THE POWERED DPS CABLE THROUGH THE BOTTOM COVER FIRST.



-Remove the plastic bag on the coil cable.
-Insert the Powered DPS cable into the hole in the strap inlet.

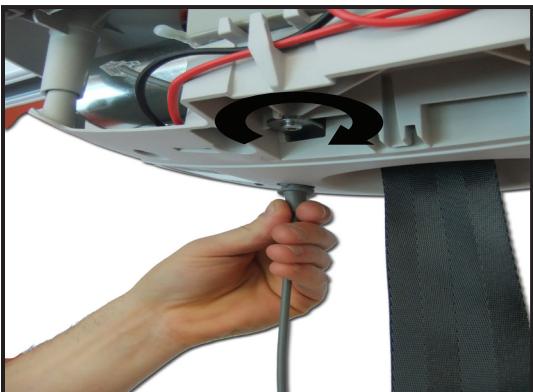


-Connect the Powered DPS cable to the 2 pin connector located on the opposite side of the main board.

NOTE

MAKE SURE TO INSERT CABLE GROMMET ON THE RIGHT SIDE (ONLY ONE POSITION IS POSSIBLE IN THIS ASSEMBLY).

-Turn the grommet 1/4 turn clockwise into the strap inlet.
-Make sure that the grommet is flush when it is completely inserted.



OK



-Mount and clip the bottom cover.

REFER TO "ACCESSORIES INSTALLATION", PAGE 6-2



-Turn the lift ON by pushing on the red button and perform a functional test (refer to "FULL FEATURE TEST", page 4-4 - Item 4 for procedure).

NOTE

DISPOSE OF THE OLD PARTS ACCORDING TO LOCAL REGULATIONS GOOD ENVIRONMENTAL PRACTICES.

REMOVING THE ECS

DANGER

SHUT OFF THE POWER BEFORE SERVICING BY PULLING ON THE RED EMERGENCY STOP CORD.

Refer to "ACCESSORIES UNINSTALLATION", page 6-3, to remove accessories.

Refer to "REMOVING THE LIFT FROM THE RAIL", page 6-4



-Remove bottom cover and put the lift on a table.



-Disconnect the ECS connector from the main board.



-Disconnect black and red cable on the ECS trolley.
 -Remove the ECS trolley of the lift trolley.
 -Undo the M5 screw using a 8mm socket.
 -Remove the plastic support.
 -Remove the ECS cable.

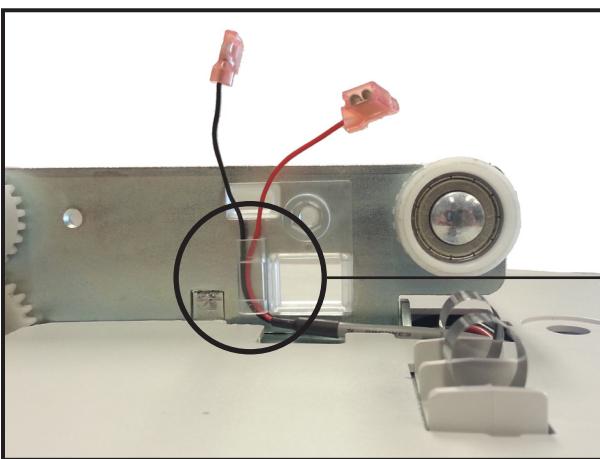
**NOTE**

DISPOSE OF THE OLD PARTS ACCORDING TO LOCAL REGULATIONS GOOD ENVIRONMENTAL PRACTICES.

INSTALLING THE ECS



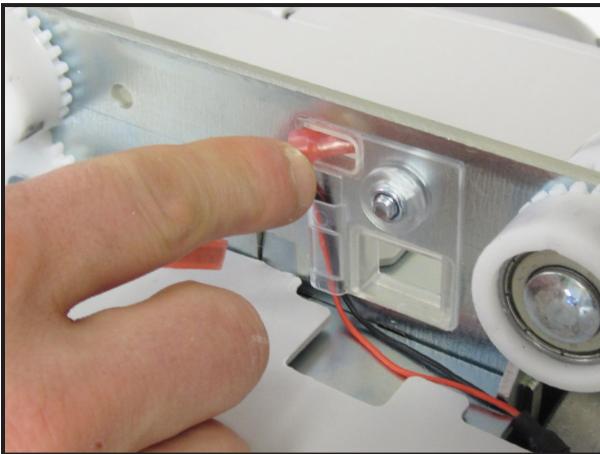
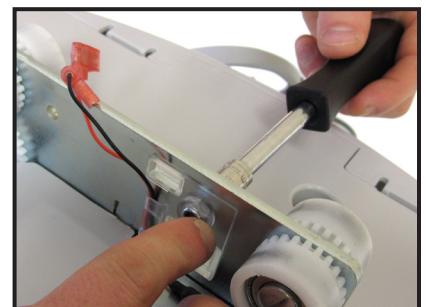
-Insert the ECS cable through the top cabin.



-Pass the ECS cable through the appropriate passage in plastic support and then mount the assembly to the trolley.
 -Mount and tighten the M5 screw, using a 8mm socket.

NOTE

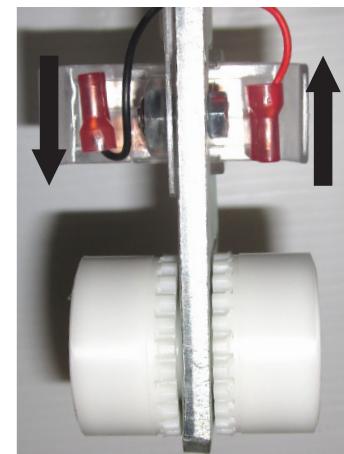
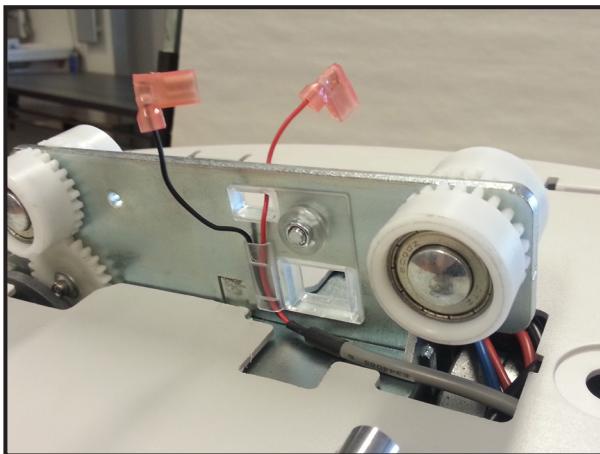
MAKE SURE THE WIRES
ARE INSTALLED BETWEEN
THE METAL TROLLEY AND
THE PLASTIC SUPPORT.



-Pass one of the wire through the small hole in the plastic support.

NOTE

THE RED AND BLACK WIRES CAN BE CONNECTED
TO EITHER SIDE OF THE ECS TROLLEY.



-Pass the ECS trolley through the big hole.

-Connect the red and black wire on the ECS trolley.

NOTE

PAY ATTENTION TO THE
CONNECTORS ORIENTATION

NOTE

ECS TROLLEY MUST MOVE
WITHOUT RESTRICTION WHEN
INSTALLED IN THE SUPPORT



-Connect the ECS connector on the main board.



-Mount and clip the bottom cover.

| Refer to "INSTALLING THE LIFT ON THE RAIL", page 6-5
|



| Refer to "ACCESSORIES INSTALLATION", page 6-2
|

-Turn the lift ON by pushing on the red button and perform a functional test (refer to "FULL FEATURE TEST", page 4-4 - Item 1 for procedure).

REMOVING THE TOP CABIN

NOTE

BEFORE DISASSEMBLING LOWER STRAP AROUND 60CM (24 IN)

DANGER

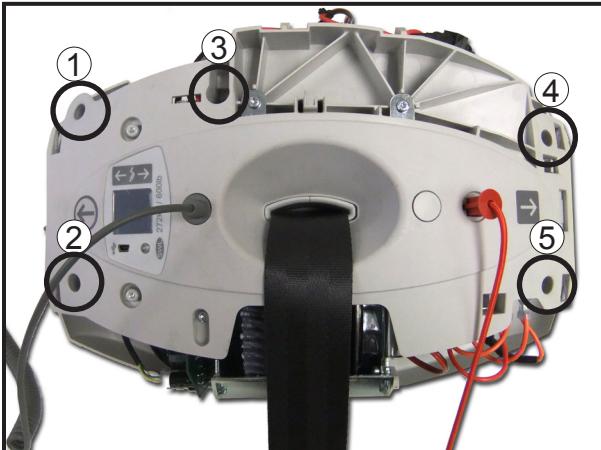
SHUT OFF THE POWER BEFORE SERVICING BY PULLING ON THE RED EMERGENCY STOP CORD



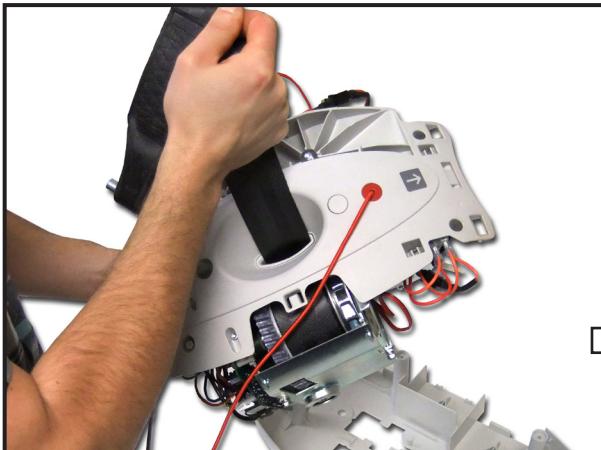
Refer to "ACCESSORIES UNINSTALLATION", page 6-3.
 Refer to "REMOVING THE LIFT FROM THE RAIL", page 6-4.

-Remove bottom cover and put the lift on a table on the trolley side.

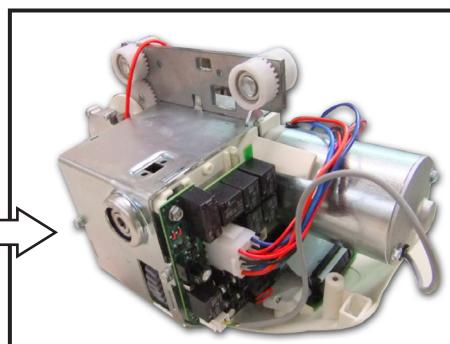
Refer to "REMOVING THE BATTERIES", page 6-17.



-Unscrew the five Torx T20 screws.



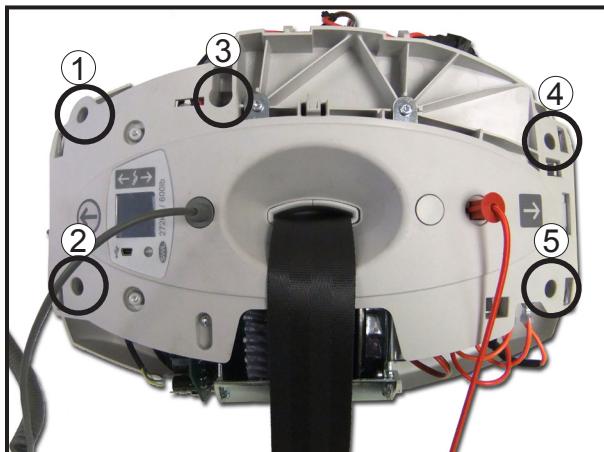
-Using the strap, pull the lift and remove the top cabin.
 -Turn over the lift.



NOTE

DISPOSE OF THE OLD PARTS ACCORDING TO LOCAL REGULATIONS GOOD ENVIRONMENTAL PRACTICES.

INSTALLING THE TOP CABIN



WARNING

MAKE SURE NOT TO PINCH ANY WIRE WHILE REASSEMBLING THE TOP CABIN.

NOTE

DO NOT OVER TORQUE THE SCREWS, THE PLASTIC HOLE COULD STRIP.

- Install the top cabin and put the lift on the trolley's side.
- Install the five Torx T20 screws.

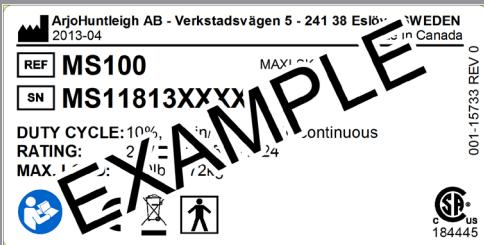


Refer to "INSTALLING THE BATTERIES", page 6-18.

-Mount and clip bottom cover.

Refer to "INSTALLING THE LIFT ON THE RAIL", page 6-5.
Refer to "ACCESSORIES INSTALLATION", page 6-2.

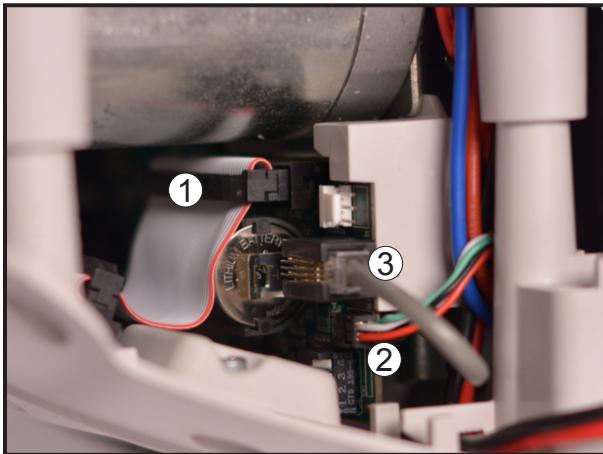
IN CASE OF REPLACEMENT
BY A NEW TOP CABIN



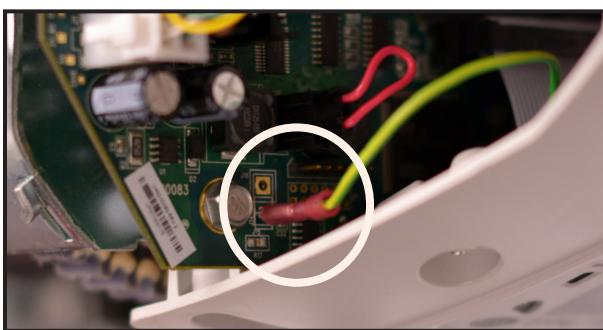
-Since the product name plate contains important information, make sure to peel it off from your original top cabin and place it on the new one.

REMOVING THE STRAP INLET

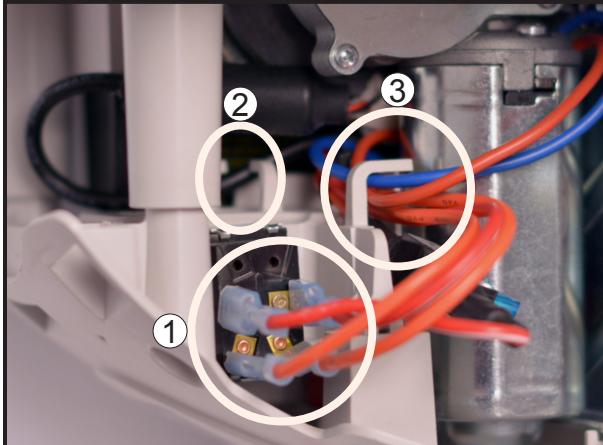
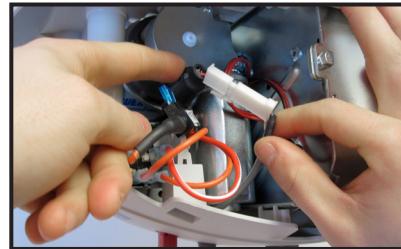
Refer to section "REMOVING THE TOP CABIN", page 6-25.



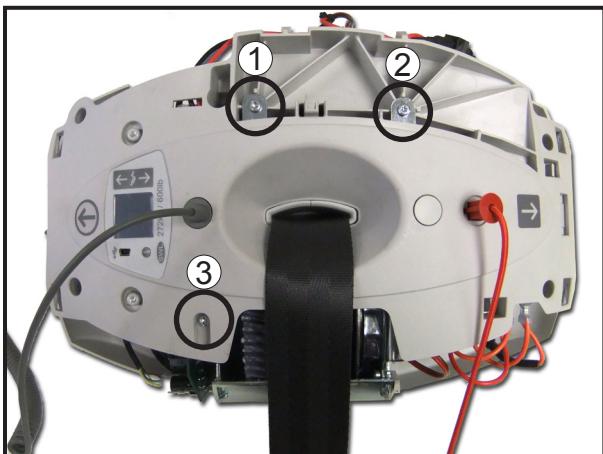
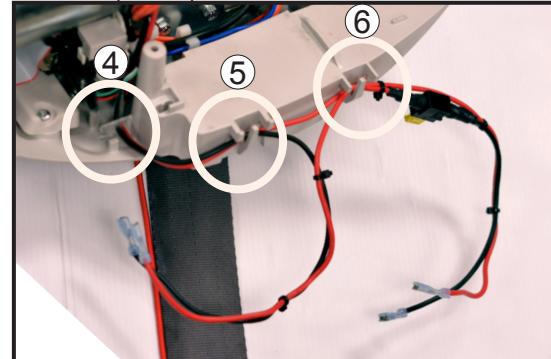
- Disconnect flat cable (1)
- Disconnect Limit kit connector (2)
- Disconnect the hand control connector (3)



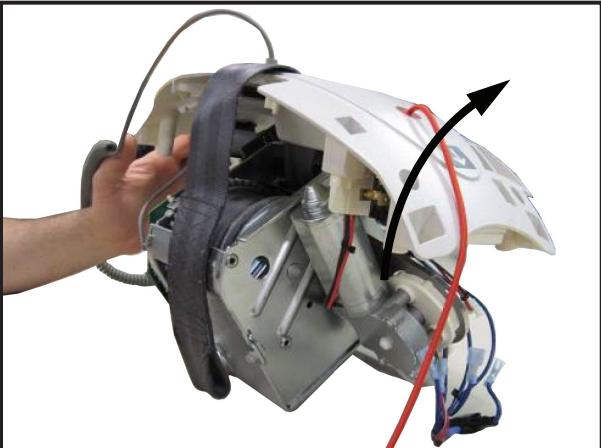
- Disconnect the green wire (ESD discharged).
- Disconnect PDPS cable if necessary.



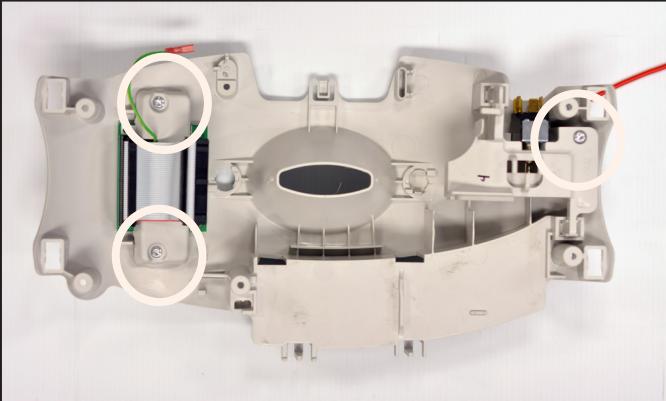
- Disconnect emergency stop cable from the toggle switch (1).
- Remove cable from the plastic clip including battery and PDPS cables (2 to 6).



- Turn the lift on the trolley side.
- Unscrew the three Torx T20 screws.



-Remove Strap Inlet.



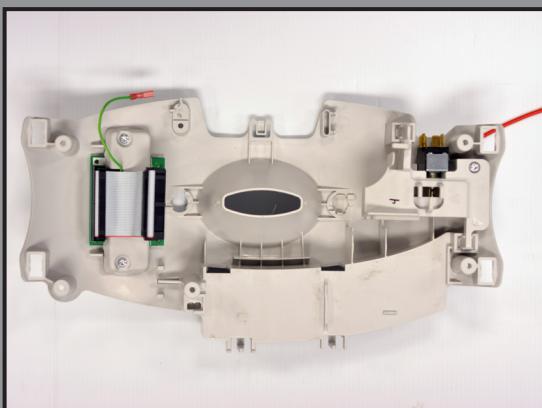
-Undo the two pan Torx screw of the user interface board assembly.

-Undo the pan Torx screw of the emergency stop system.



-Using long nose pliers, undo the two plastic clips and remove the emergency stop assembly.

PREPARATION OF THE NEW STRAP INLET



-Mount and clip the emergency stop assembly.

-Install the Torx T20 screw of the emergency stop assembly.

NOTE

DO NOT OVER TORQUE THE SCREW, THE PLASTIC HOLE COULD STRIP

-Make sure the emergency stop assembly is working properly.

-Install the two Torx T20 screws of the user interface board assembly.

-If previous safe working load (SWL) setting was lower than 600lb (272kg), install the proper SWL sticker.

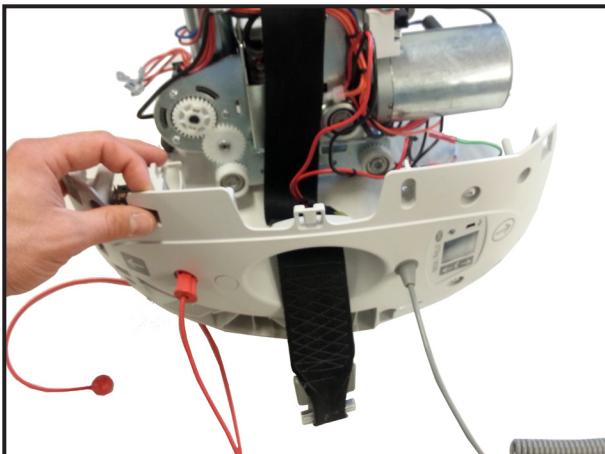
WARNING

THE SAFE WORKING LOAD (SWL) DISPLAYED ON THE LCD SCREEN AT STARTUP MUST BE THE SAME AS THE SWL STICKER ON THE LIFT

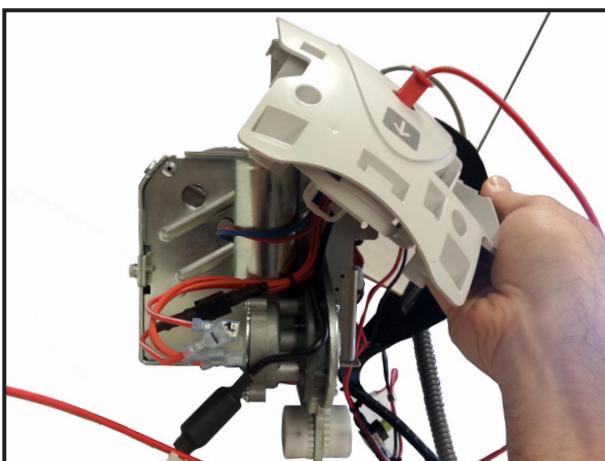
NOTE

DISPOSE OF THE OLD PARTS ACCORDING TO LOCAL REGULATIONS GOOD ENVIRONMENTAL PRACTICES.

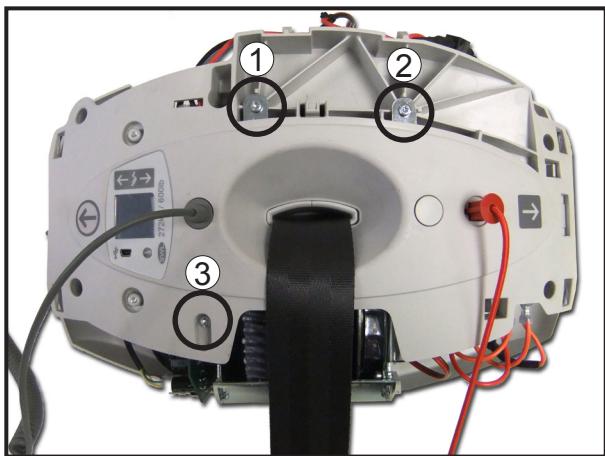
INSTALLING THE STRAP INLET



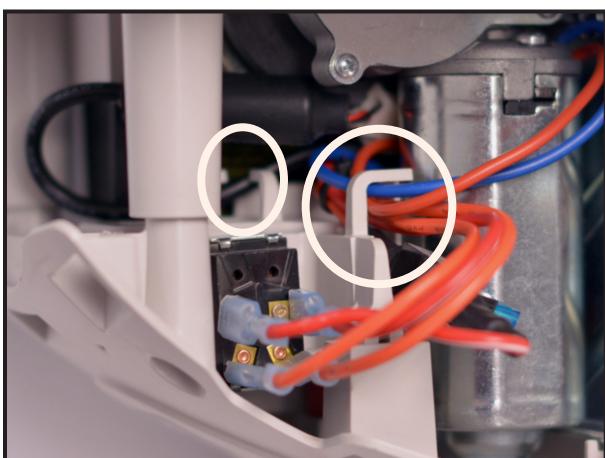
-Pass the strap through the strap inlet.



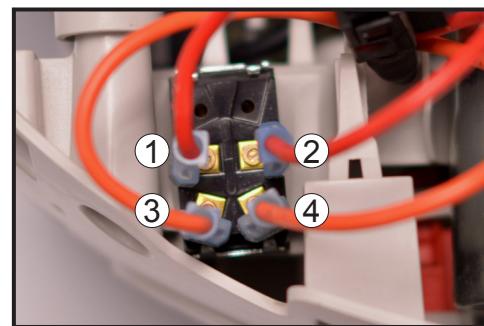
-Install the strap inlet and make sure the metal bracket passes through the strap inlet.



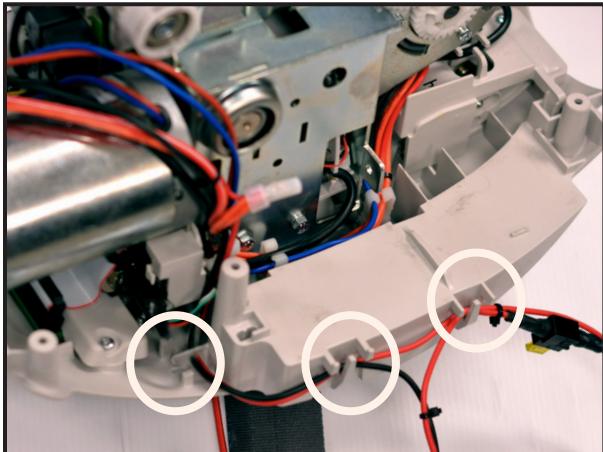
-Install the three Torx T20 screws.



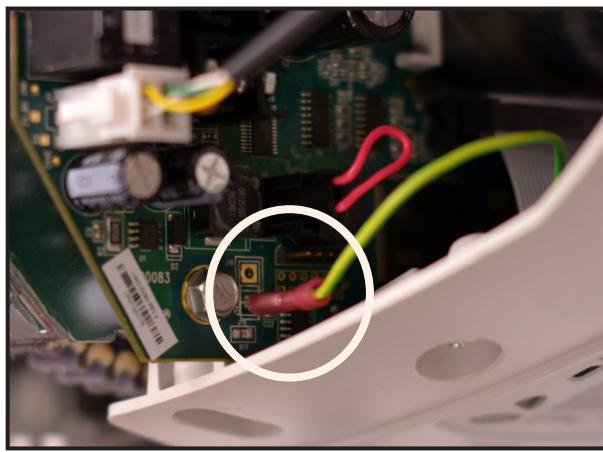
-Connect emergency stop cable to the toggle switch and pass the cables in the plastic clip.



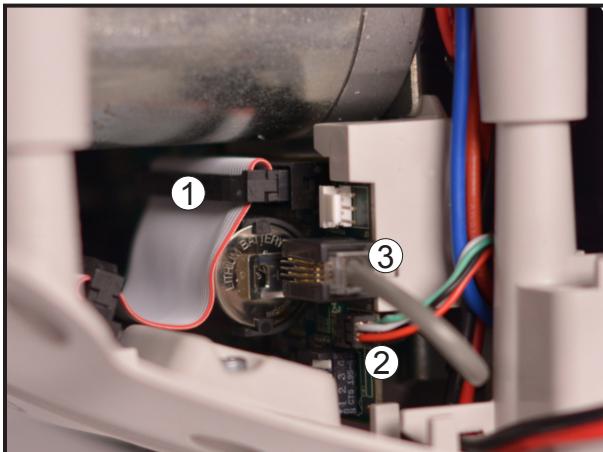
- ① RED/WHITE
- ② RED/WHITE
- ③ ORANGE
- ④ ORANGE



-Pass battery cables in the three plastic clips.



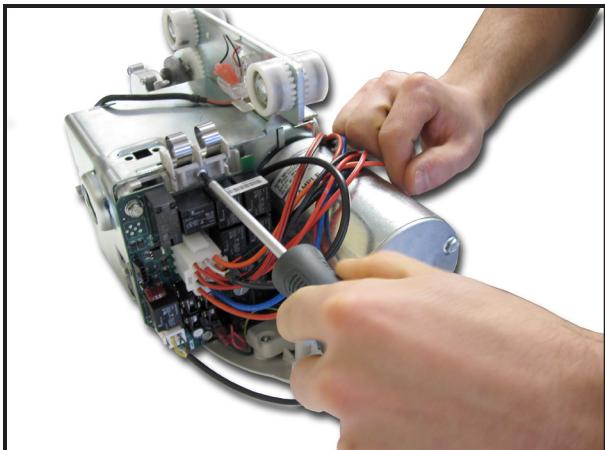
-Connect the green wire (ESD discharged).



-Connect flat cable (1).
-Connect Limit kit connector (2).
-Connect the hand control connector (3).

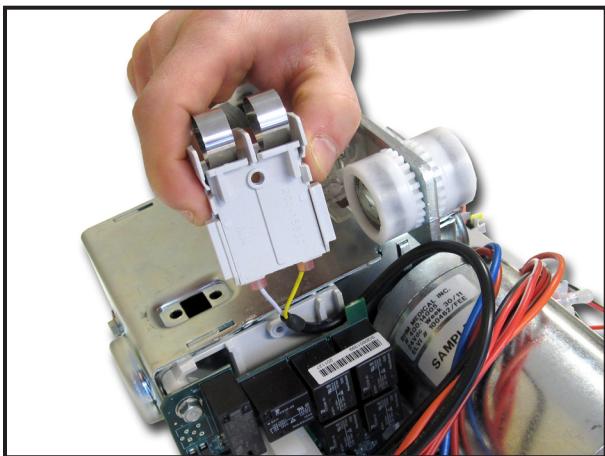
Refer to section "INSTALLING THE TOP CABIN", page 6-26

REMOVING THE CONTACT BLADE KIT



Refer to "REMOVING THE TOP CABIN", page 6-25

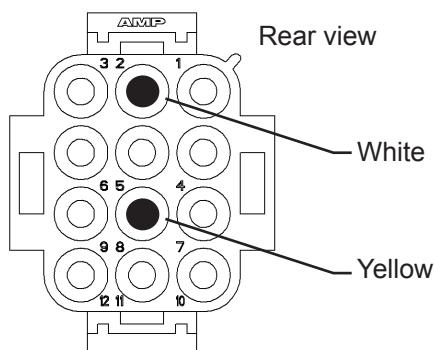
-Unscrew the Torx T20 screw of the Contact Blade assembly.



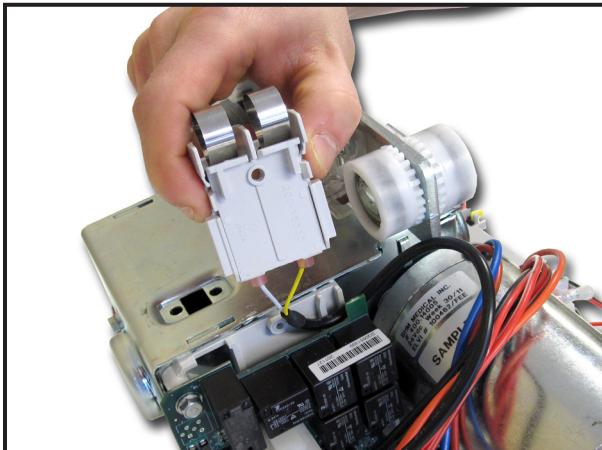
-Pull on the contact blade assembly to remove it.



-Using a pin extractor, remove the pin at position 2 and 8.

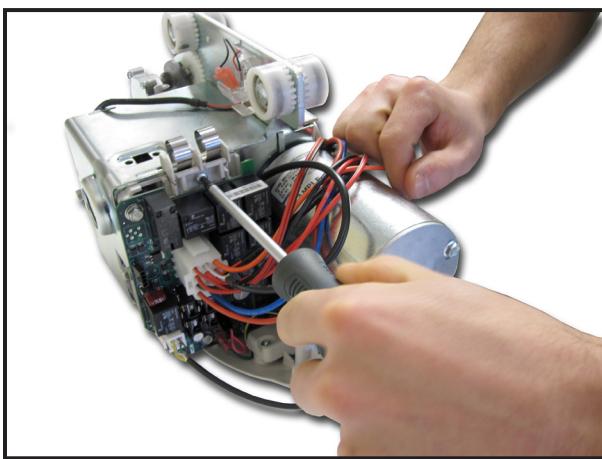


INSTALLING THE CONTACT BLADE KIT

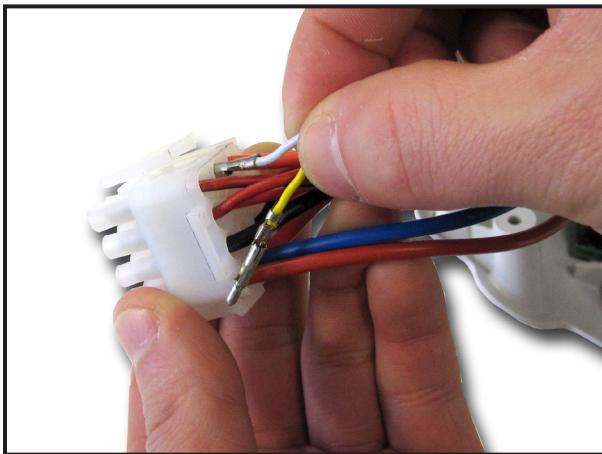


Refer to "REMOVING THE TOP CABIN", page 6-25

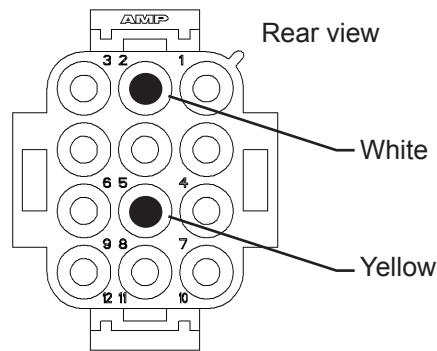
-Insert the contact blade assembly behind the main board.



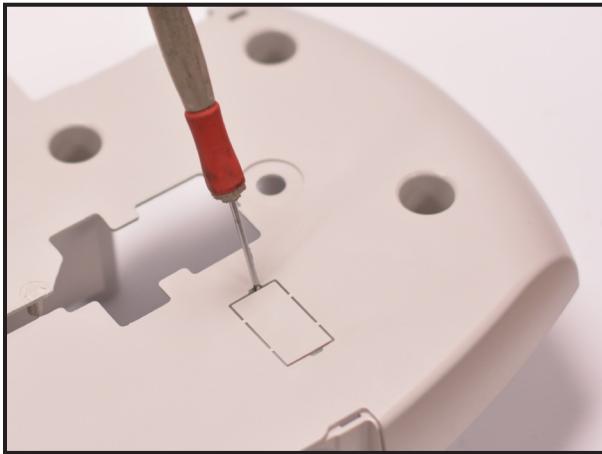
-Install the new Contact Blade assembly with a Torx T20 screw.



-Insert and clip the white wire into the position 2 and the yellow wire at position 8.



-If it is a new contact blade installation, remove plastic tab on the top cabin, by using a screwdriver or similar.



Refer to section "INSTALLING THE TOP CABIN", page 6-26.

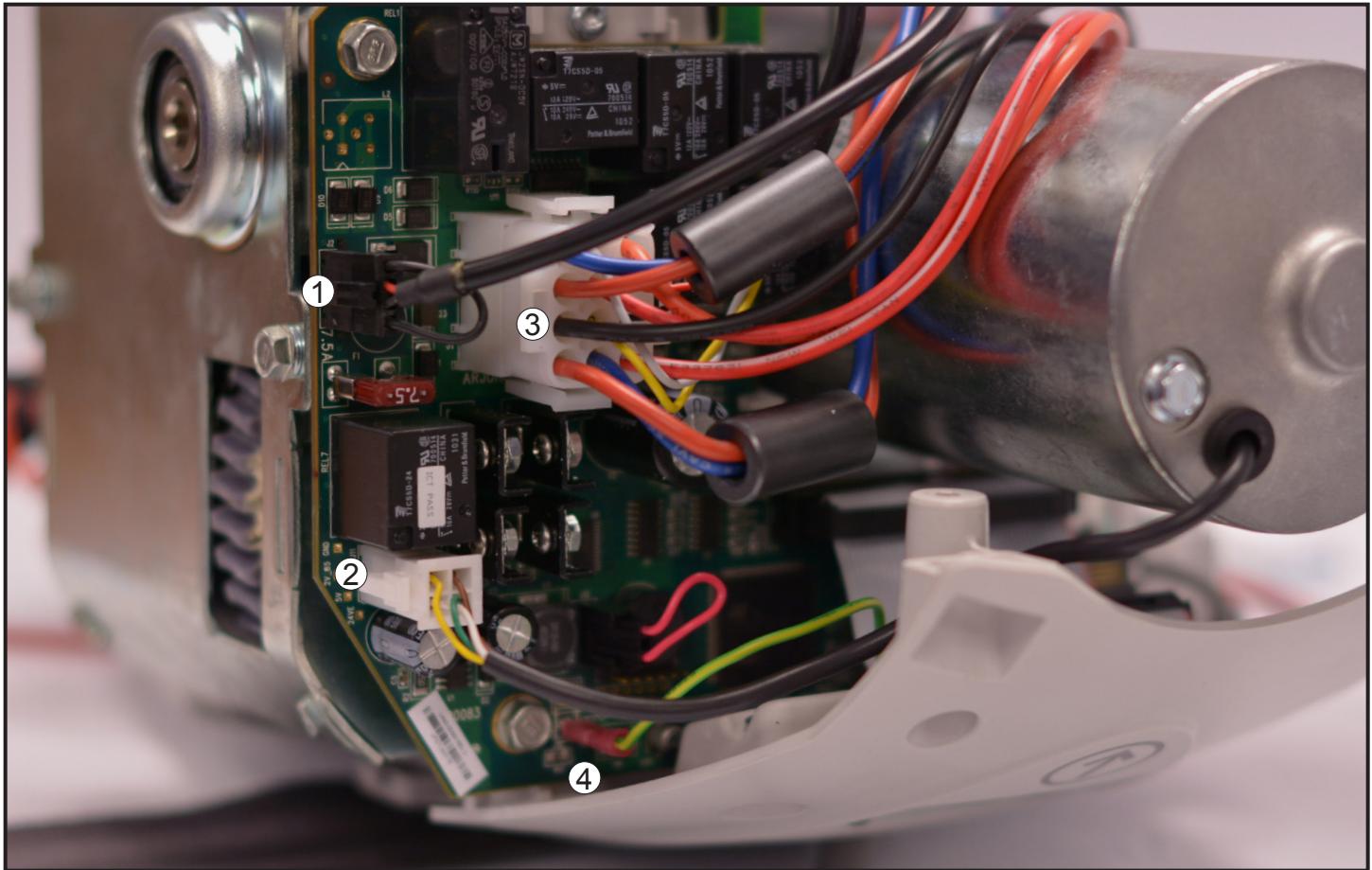
-Turn the lift ON by pushing on the red button and perform a functional test (refer to "FULL FEATURE TEST", page 4-4, item 1 for procedure).

REMOVING THE MAIN BOARD

NOTE

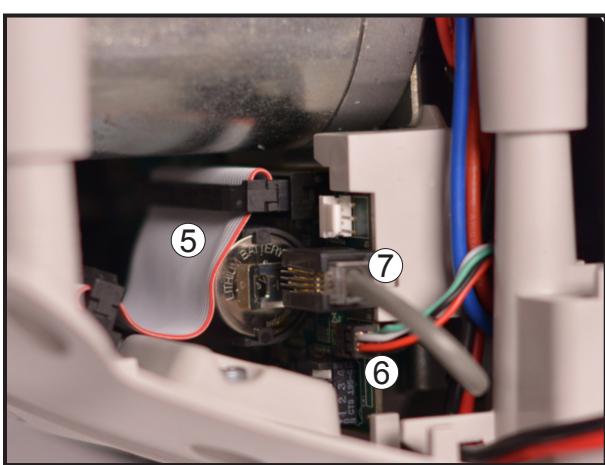
NEVER CHANGE THE MAIN BOARD AND THE USER INTERFACE BOARD SIMULTANEOUSLY. THE LIFT MAY NOT BE USABLE (E.G. DISPLAY STAYS BLACK, RED LED LIGHTENS AND LIFT REMAINS IN STARTING MODE).

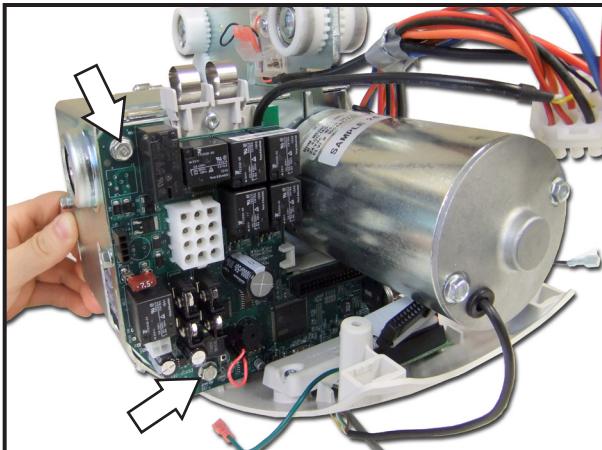
Refer to "REMOVING THE TOP CABIN", page 6-25



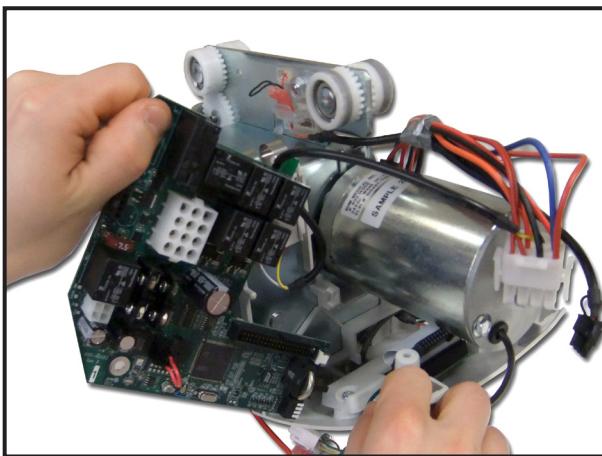
- Disconnect ECS connector (if applicable) (1)
- Disconnect the 4 pin connector (Motor encoder) (2)
- Disconnect the 12 pins connector (3)
- Disconnect green wire (ESD discharged) (4)

- Disconnect flat cable (5)
- Disconnect Limit Kit connector (6)
- Disconnect the hand control connector (7)





-Using an 8mm socket, unscrew the two M5 screws on the main board.



-Slide out the main board.

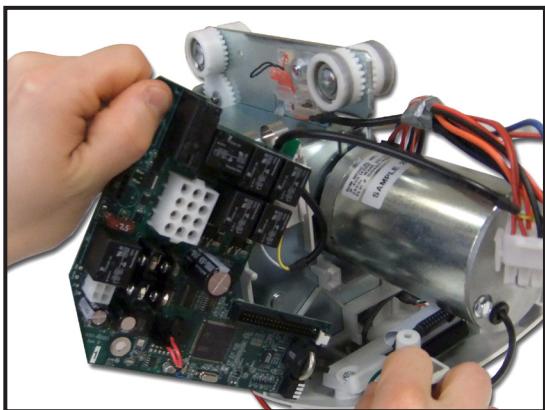
CAUTION

WHEN HANDLING THE ELECTRONICS OF THE LIFT, YOU MUST BE ESD PROTECTED. NON-COMPLIANCE WITH THESE INSTRUCTIONS CAN LEAD TO AN ELECTROSTATIC DISCHARGE CAUSING FAILURE.

NOTE

DISPOSE OF THE OLD PARTS ACCORDING TO LOCAL REGULATIONS GOOD ENVIRONMENTAL PRACTICES.

INSTALLING THE MAIN BOARD



WARNING

FOR MS2 PLUS, ONLY REPLACE BOARDS WITH GENUINE PARTS. NEVER SWAP BOARDS BETWEEN LIFTS.

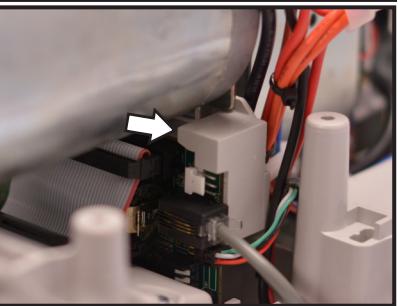
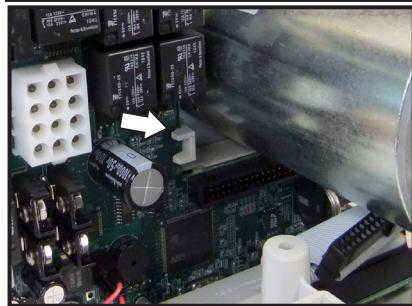
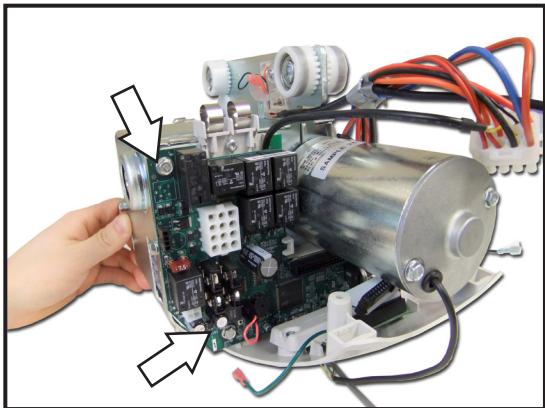
-Slide the main board inside the plastic support.

WARNING

ALWAYS ORDER MAIN BOARD FROM THE MANUFACTURER TO AVOID LOSING INFORMATION (E.G. CALIBRATION DATA, SERIAL NUMBER, HISTORICAL DATA, PREVENTIVE MAINTENANCE SCHEDULE).

NOTE

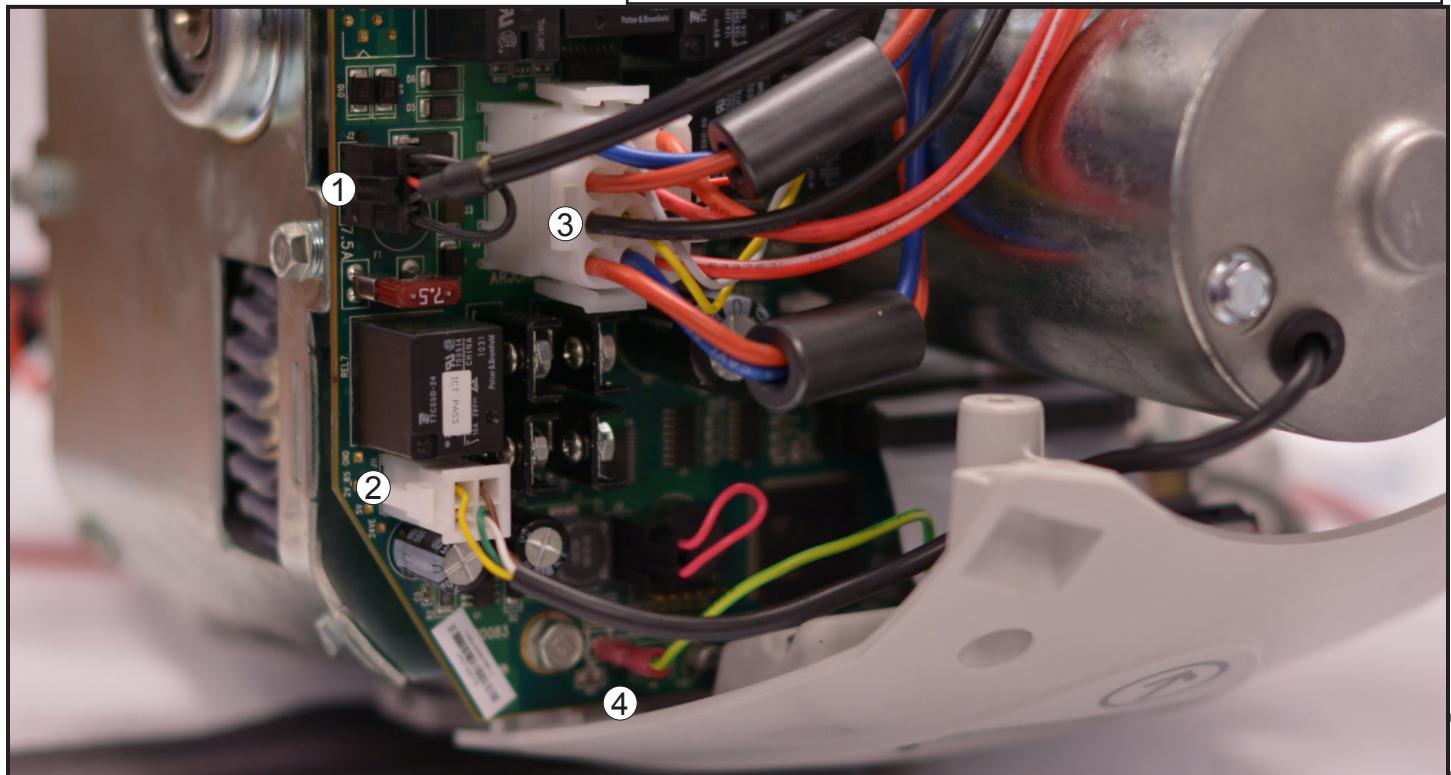
MAKE SURE THE BOARD IS CORRECTLY INSTALLED ON ITS SUPPORT.



-Fix the board in place with the two M5 screws.

NOTE

DO NOT OVERTIGHTEN THE SCREWS TO AVOID ANY DAMAGE TO THE MAIN BOARD.

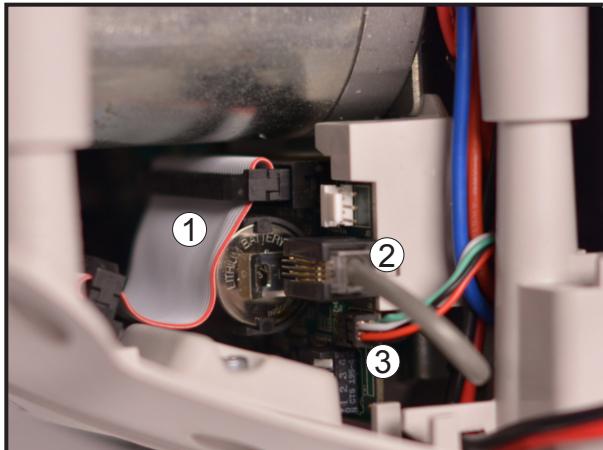


-Disconnect ECS connector (if applicable) (1)

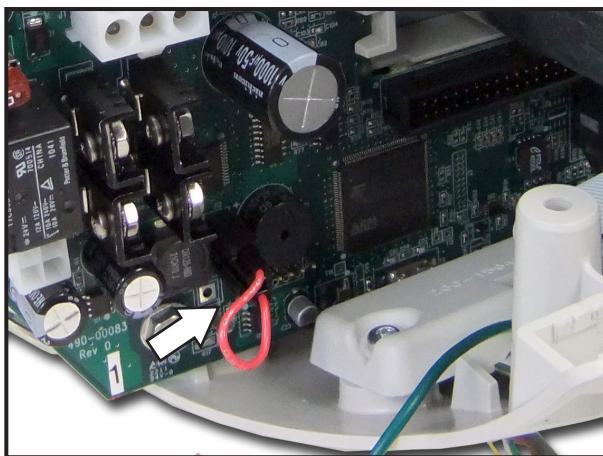
-Disconnect the 4 pin connector (Motor encoder) (2)

-Disconnect the 12 pins connector (3)

-Disconnect green wire (ESD discharged) (4)



- Connect flat cable (1)
- Connect the hand control connector (2)
- Connect Limit Kit connector (3)



- Install the proper jumper to have the appropriate SWL.
- Make sure to have the same SWL on the screen at start-up, on the display sticker and on the rail system. If not, install the connector for the lowest safe working load.

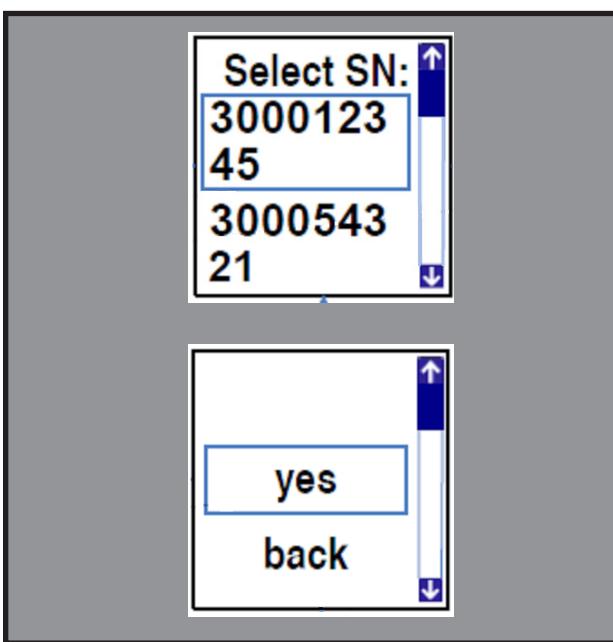
NOTE

- NO JUMPER EQUALS TO 265 LBS (120 KG)
- ORANGE JUMPER EQUALS TO 440 LBS (200 KG)
- RED JUMPER EQUALS TO 600 LBS (272 KG)



Refer to section “INSTALLING THE TOP CABIN”, page 6-26

- Turn the lift ON by pushing on the red button and perform a functional test (refer to “FULL FEATURE TEST”, page 4-4 - Item 1, 5 and 6 for procedure).



NOTE

FROM SOFTWARE 2.2.X AND HIGHER, IF THE REPLACEMENT BOARD ALREADY HAS DATA INSIDE ITS MEMORY, AT THE STARTUP, THE SYSTEM WILL ASK YOU TO CONFIRM THE SERIAL NUMBER OF THE LIFT.

- The serial number of the lift is located on the product name plate on the top cabin.

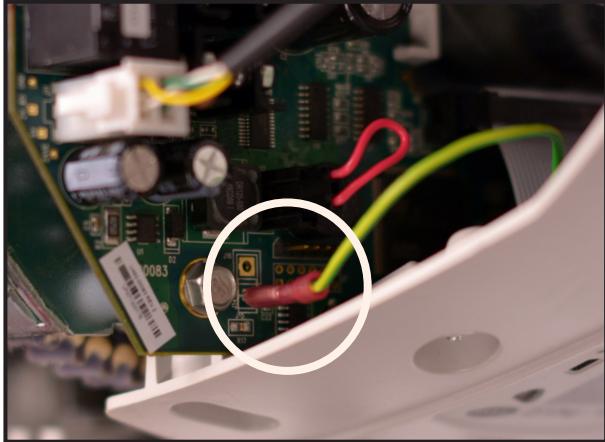
-Select the serial number of the lift and press the  button.

-Confirm your choice by selecting “yes” and pressing on the  button. Note that “back” can be used to return to the serial number selection window.

REMOVING THE USER INTERFACE BOARD

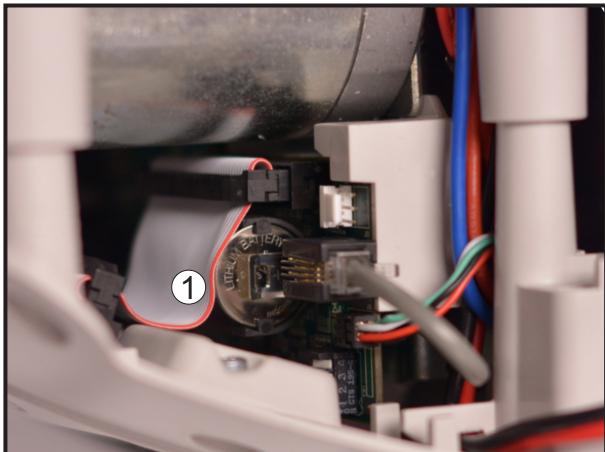
NOTE

NEVER CHANGE THE MAIN BOARD AND THE USER INTERFACE BOARD SIMULTANEOUSLY. THE LIFT MAY NOT BE USABLE (E.G. DISPLAY STAYS BLACK, RED LED LIGHTENS AND LIFT REMAINS IN STARTING MODE).

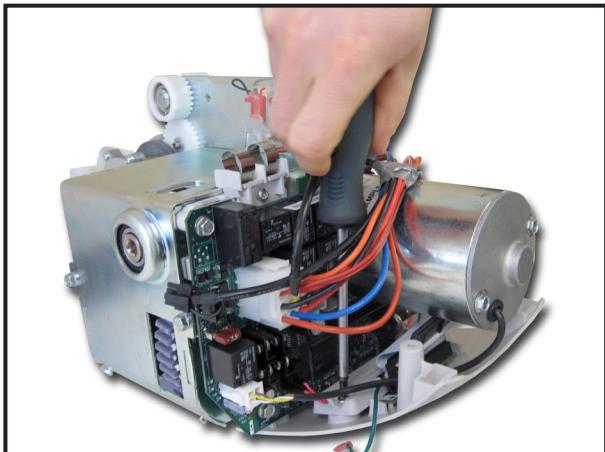


- Refer to section "REMOVING THE TOP CABIN", page 6-25

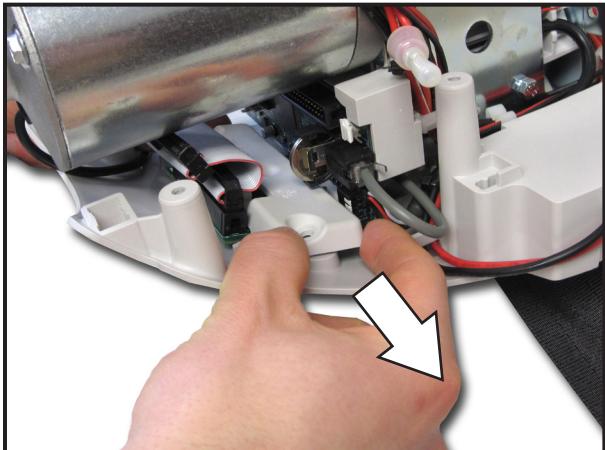
- Disconnect green wire (ESD discharged).



- Disconnect the flat cable from the main board (1).



- Unscrew the two Torx T20 screws of the plastic support of the user interface board assembly.

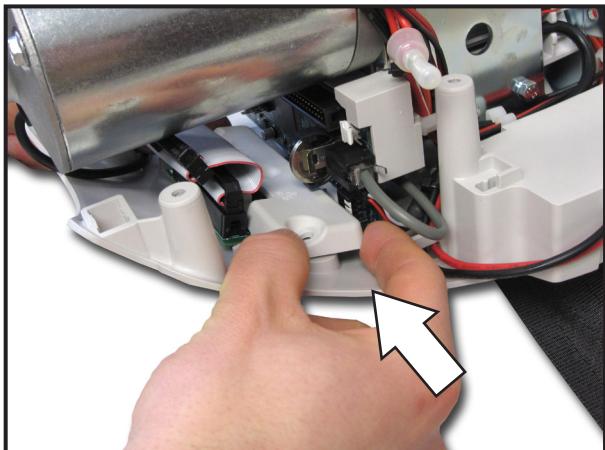


-Remove user interface board assembly.

NOTE

DISPOSE OF THE OLD PARTS ACCORDING TO LOCAL REGULATIONS GOOD ENVIRONMENTAL PRACTICES.

INSTALLING THE USER INTERFACE BOARD

**WARNING**

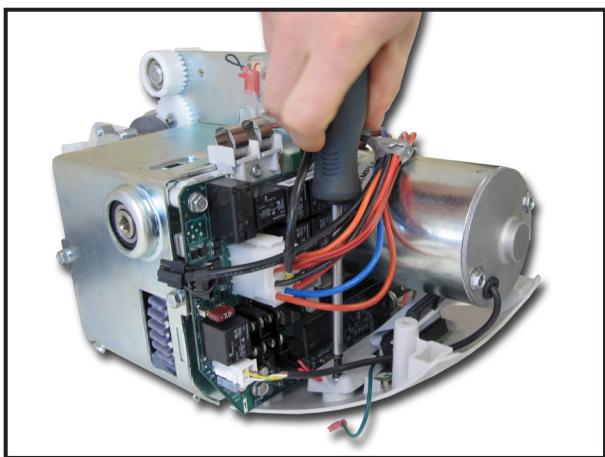
ONLY REPLACE BOARDS WITH GENUINE MS2P PARTS.
NEVER SWAP BOARDS BETWEEN LIFTS.

WARNING

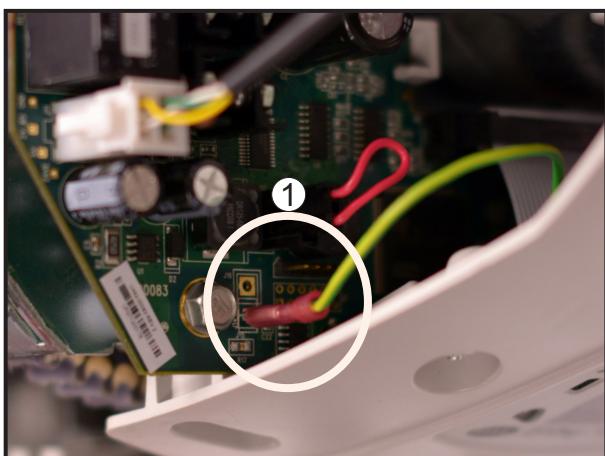
ALWAYS ORDER USER INTERFACE BOARD FROM THE MANUFACTURER TO AVOID LOSING INFORMATION (E.G. CALIBRATION DATA, SERIAL NUMBER, HISTORICAL DATA, PREVENTIVE MAINTENANCE SCHEDULE).

- Peel off the plastic film from the LCD screen.
- Install the user interface board assembly.

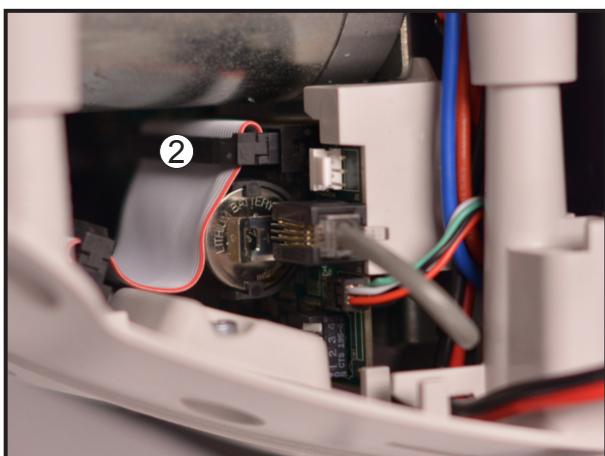
- Install the two Torx T20 screws.



- Connect the green wire (ESD discharged) to the main board (1).



- Connect the flat cable to the main board (2).





Refer to section “INSTALLING THE TOP CABIN”, page 6-26

- Turn the lift ON by pushing on the red button and verify if the LCD screen is working properly.
- Test the “up and down” alternate button.

Select SN: ↑
3000123
45
3000543
21 ↓

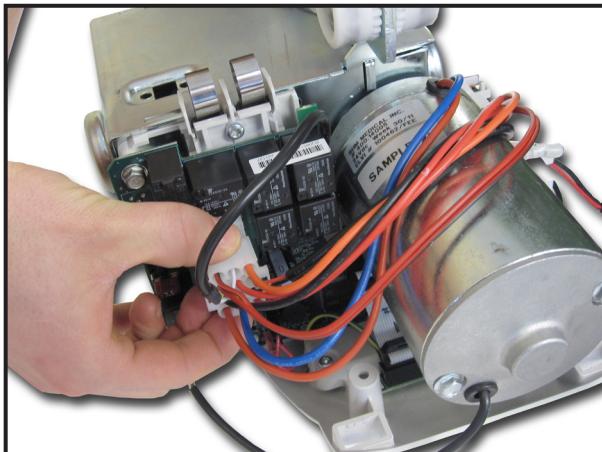
yes ↑
back ↓

NOTE

FROM SOFTWARE 2.2.X AND HIGHER, IF THE REPLACEMENT BOARD ALREADY HAS DATA INSIDE ITS MEMORY, AT THE STARTUP, THE SYSTEM WILL ASK YOU TO CONFIRM THE SERIAL NUMBER OF THE LIFT.

- The serial number of the lift is located on the product name plate on the top cabin.
- Select the serial number of the lift and press the  button.
- Confirm your choice by selecting “yes” and pressing on the  button. *Note that “back” can be used to return to the serial number selection window.*

REMOVING THE LEFT/RIGHT MOTOR

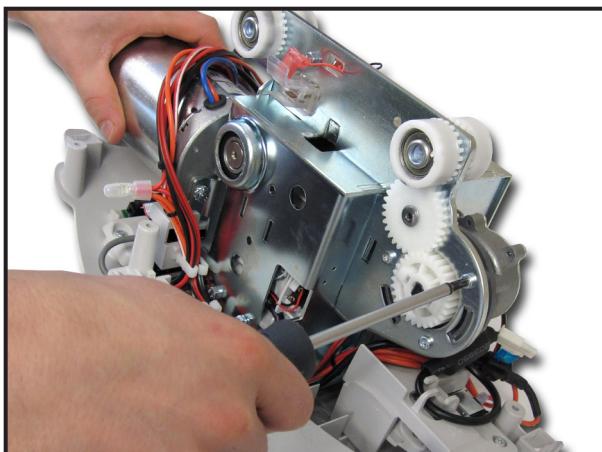
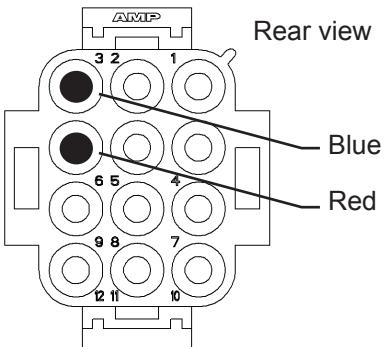
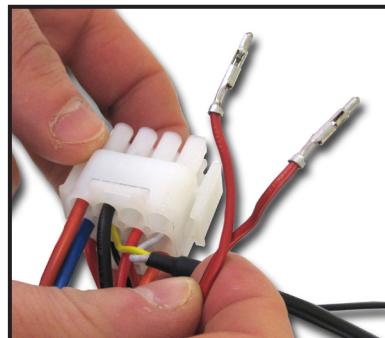


Refer to section “REMOVING THE TOP CABIN”, page 6-25

-Disconnect the 12 pins connector.



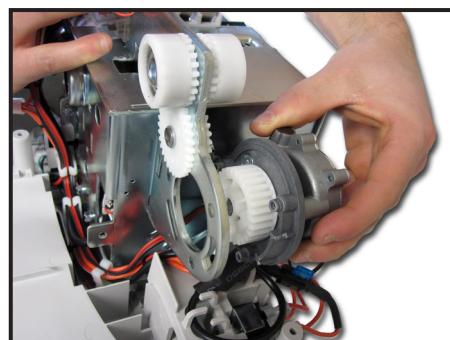
-Using a pin extractor, remove the pin at position 3 and 6.



-Unscrew the three Torx T20 screws.

-Remove L/R Motor.

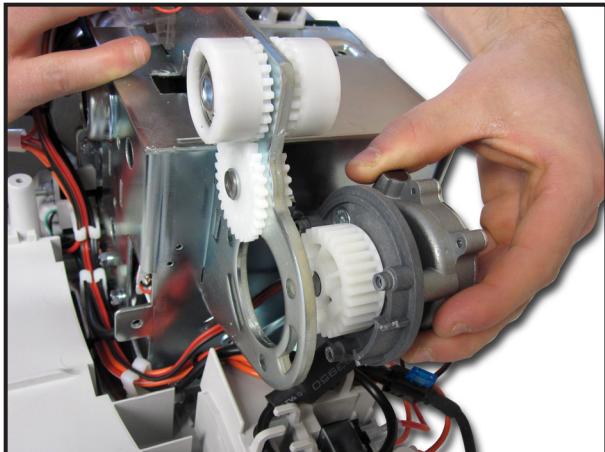
-Undo the wires from their path.



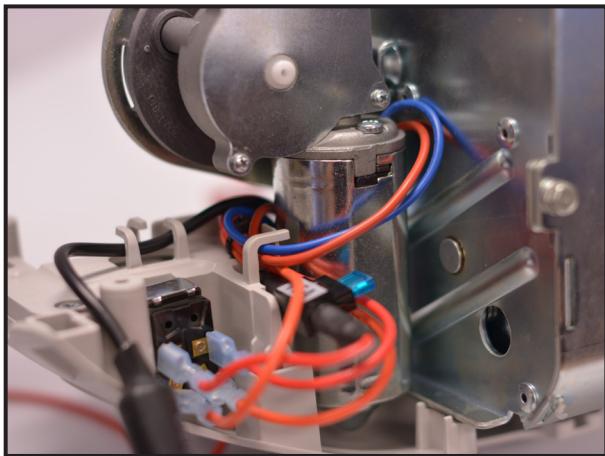
NOTE

DISPOSE OF THE OLD PARTS ACCORDING TO LOCAL REGULATIONS GOOD ENVIRONMENTAL PRACTICES.

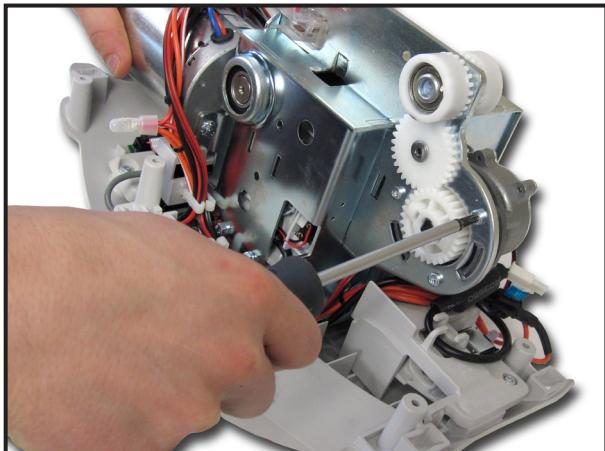
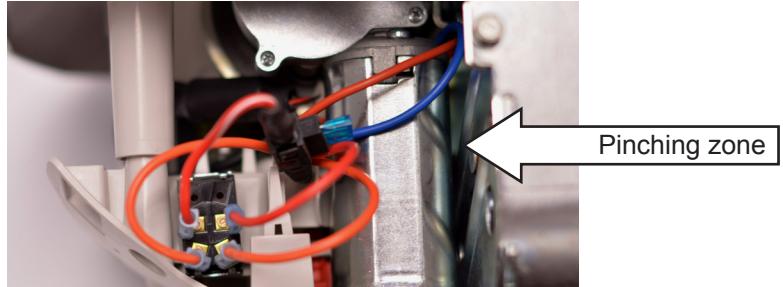
INSTALLING THE LEFT/RIGHT MOTOR



-Mount the new Left/Right motor and make sure both gears are aligned together properly.

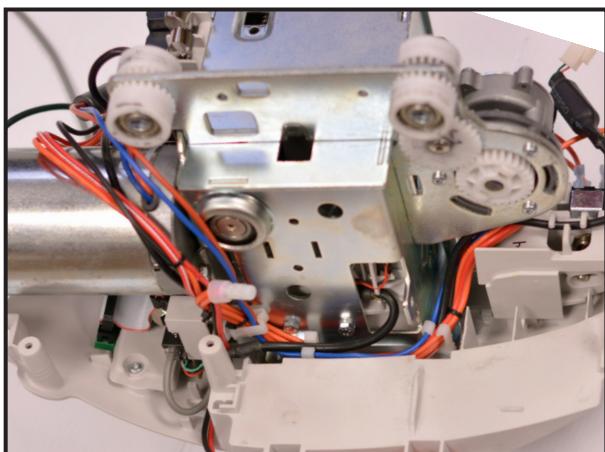


NOTE
CONSIDER CABLE PLACEMENT TO AVOID PINCHING THE CABLE BETWEEN THE FRAME AND THE LEFT/RIGHT MOTOR

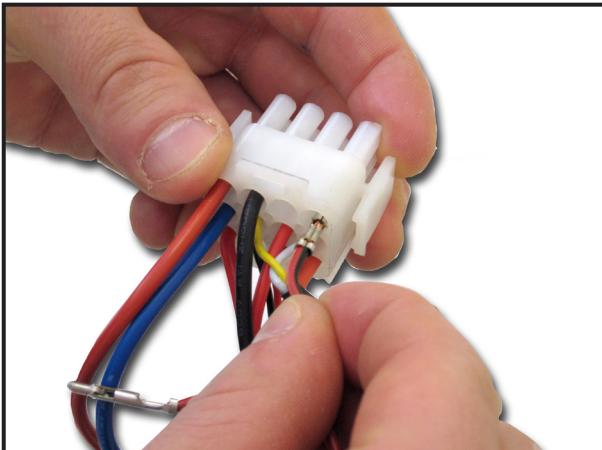


-Install the three Torx T20 screws.

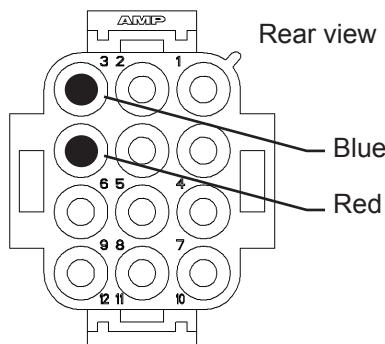
NOTE
DO NOT OVER TORQUE THE SCREW, THE PLASTIC HOLE COULD STRIP



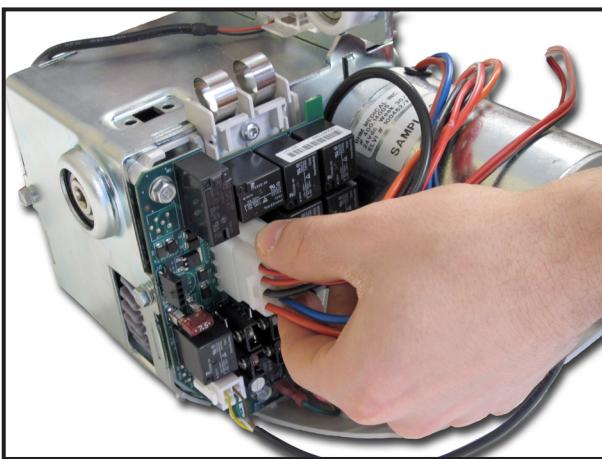
-Pass the wires along their path.



-Insert blue wire into the position 3 and the red wire into the position 6.



-Connect the 12 pins connector to the main board.



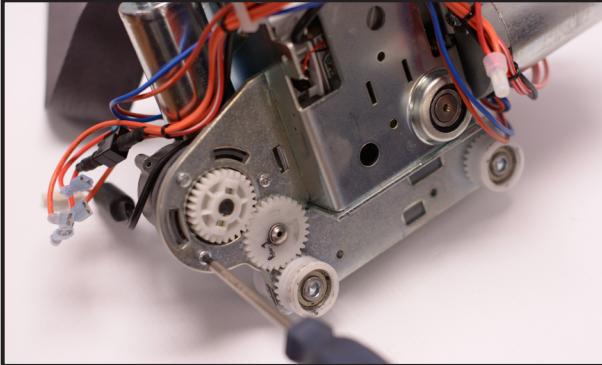
Refer to section "INSTALLING THE TOP CABIN", page 6-26

-Turn the lift ON by pushing on the red button and perform a functional test (refer to "FULL FEATURE TEST", page 4-4 - Item 2 for procedure).

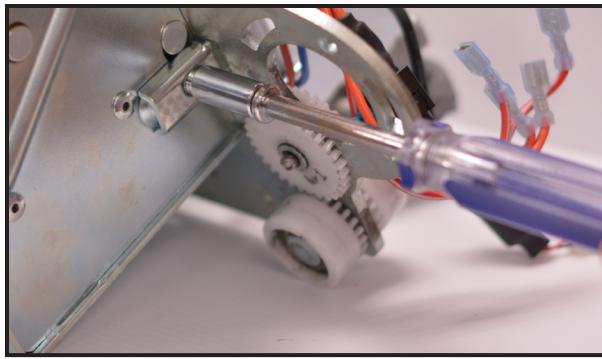
REMOVING THE LIMIT KIT

Refer to section "REMOVING THE TOP CABIN", page 6-25

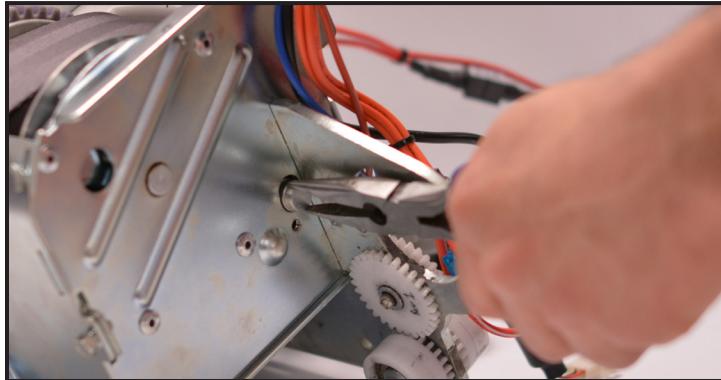
Refer to section "REMOVING THE STRAP INLET", page 6-27



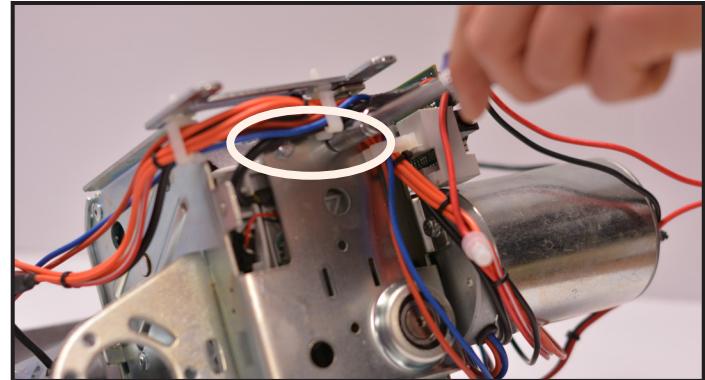
-If applicable (4-function unit), remove the Left/Right motor from the trolley (three Torx T20 screws).



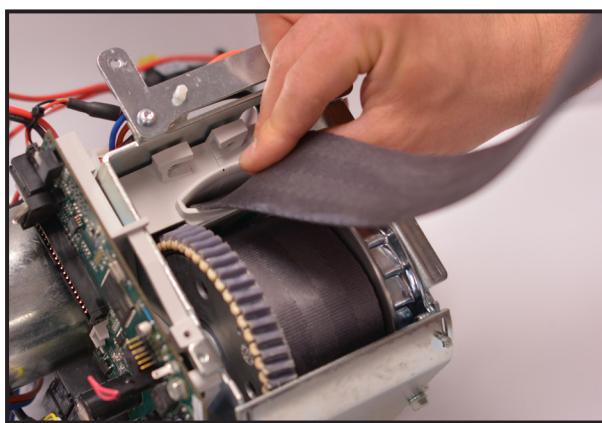
-Unscrew the M5 screw of the trolley locker.



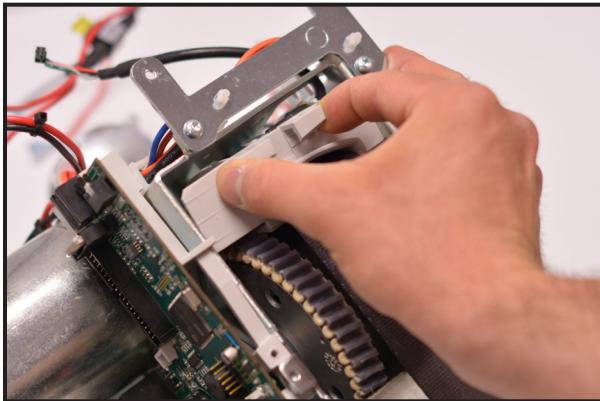
-Using long nose pliers, remove the 12mm shaft from the assembly.



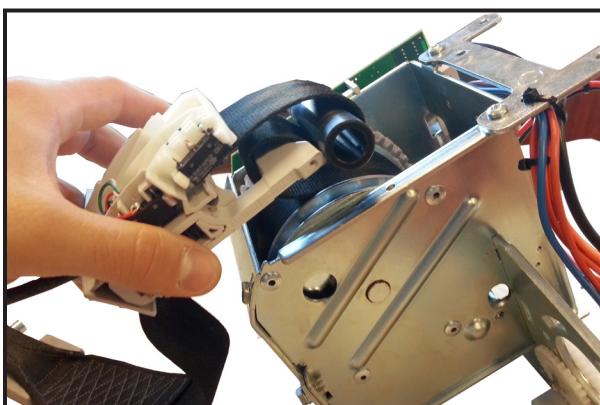
-Unscrew the two M5 screws retaining the Limit Kit assembly.



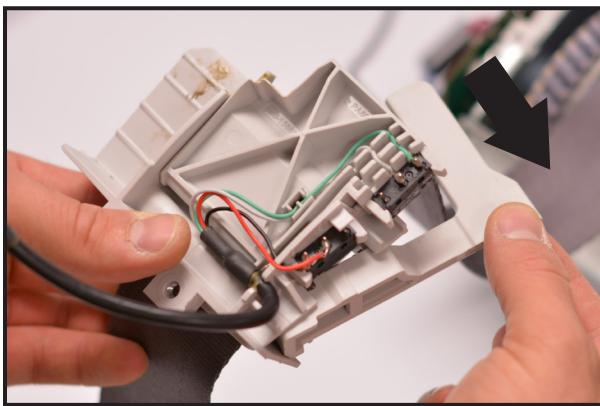
-Push the strap inside the frame around 70mm (3 in). This step will help to remove the strap roller.



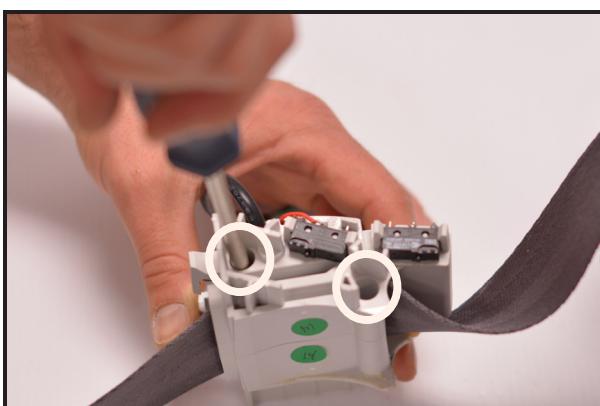
- Keep pushing the strap through the Limit Kit while pulling on it.
- Be careful to not pinch the wires.



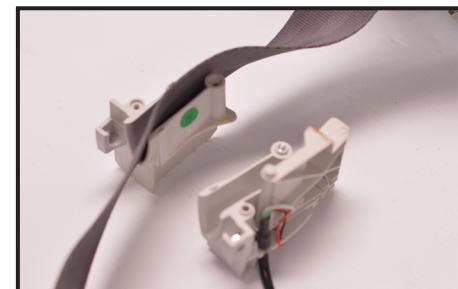
- Remove Strap roller from inside the frame by pulling on the strap.



- Remove the Lower limit arm from the Limit Kit.



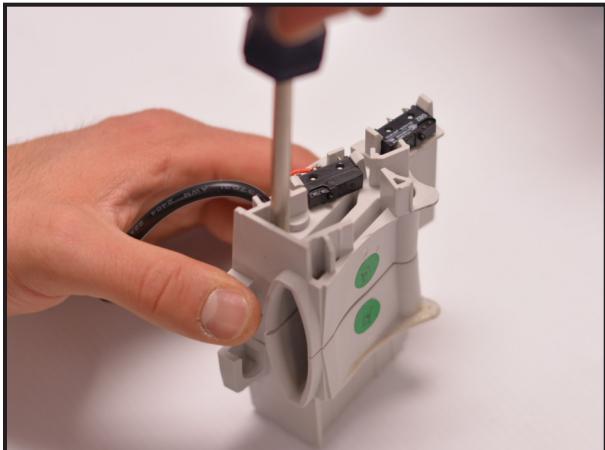
- Unscrew the two Torx T20 screws and separate the Limit Kit into two pieces.
- Remove strap.



NOTE

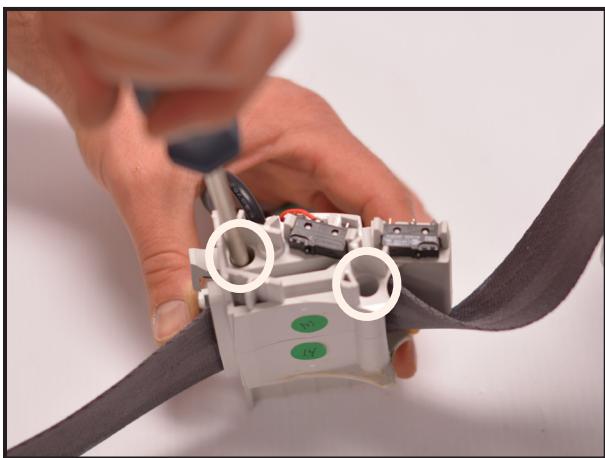
DISPOSE OF THE OLD PARTS ACCORDING TO LOCAL REGULATIONS GOOD ENVIRONMENTAL PRACTICES.

INSTALLING THE LIMIT KIT



NOTE

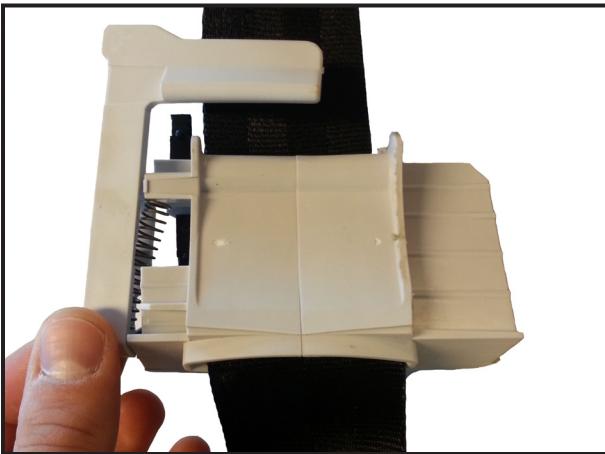
IF THE LIMIT KIT IS NEW, UNSCREW THE TWO TORX T20 SCREWS AND SEPARATE THE LIMIT KIT



- Place strap inside the Limit Kit assembly
- Mount and tighten the two Torx T20 screw.

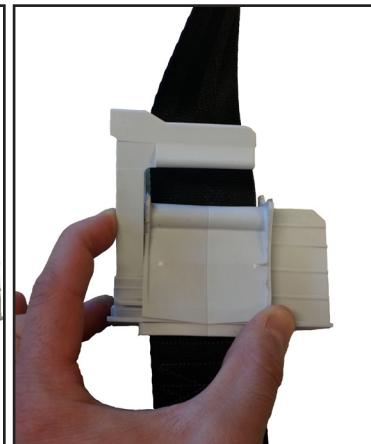
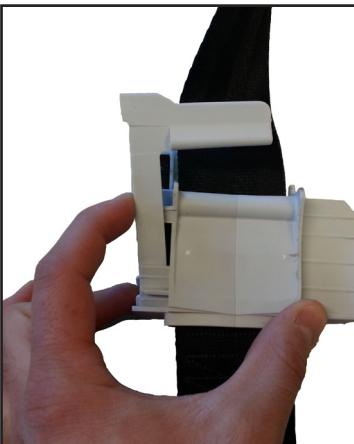


- Pop out the extremity of the spring lower limit.

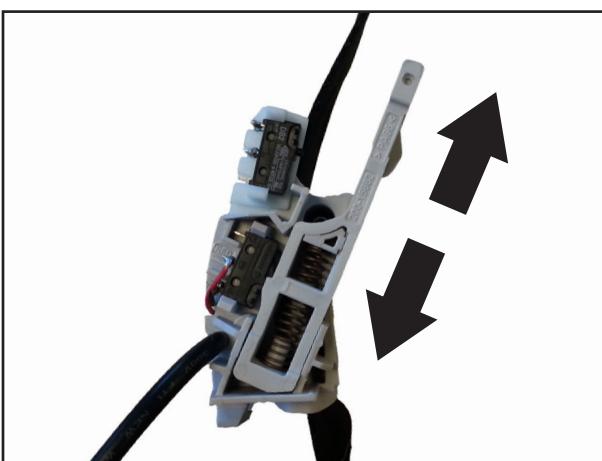


- Approach the Lower limit arm to place the spring so it will press on the wall.

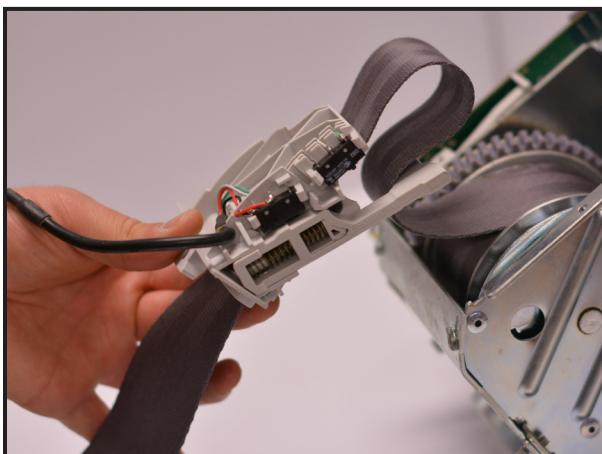




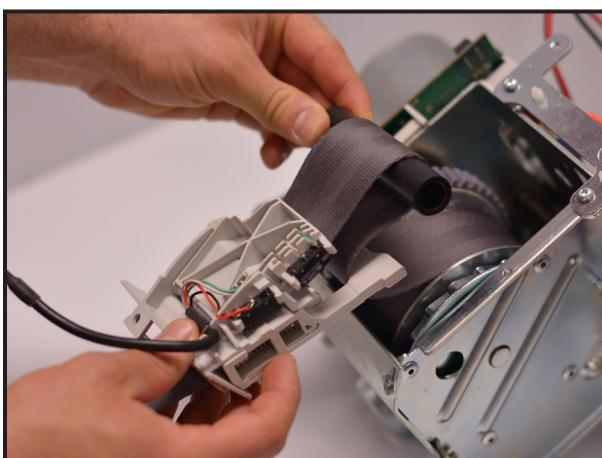
-Push the Lower limit arm in place starting with the bottom.



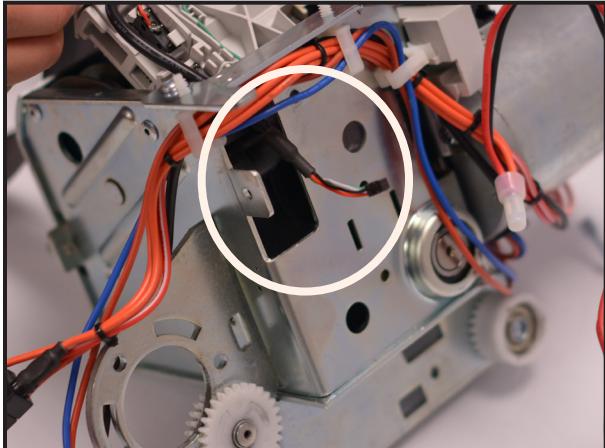
-Once the Lower limit arm is installed, verify if it moves freely. Pull on the arm and the spring shall return in its initial position without restriction.



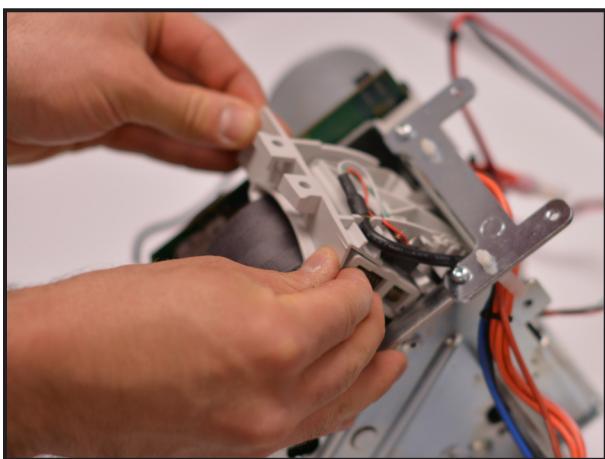
-Push strap inside the Limit Kit assembly to be able to insert the strap roller.



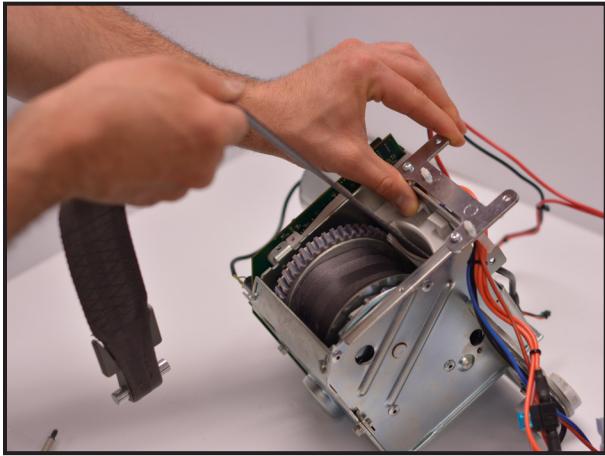
-Insert the strap roller into the assembly.

**NOTE**

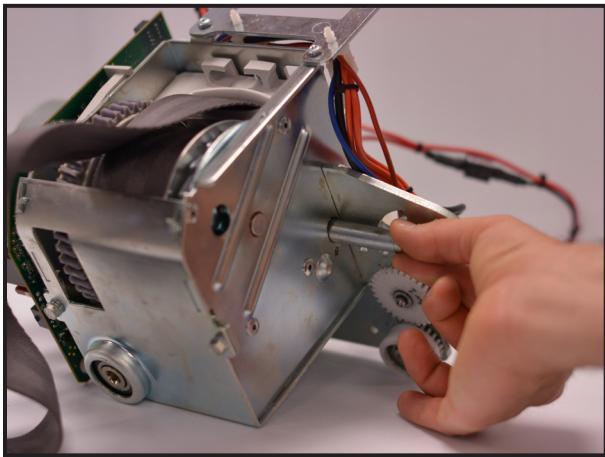
MAKE SURE THAT THE LIMIT KIT'S CABLE PASSES
THROUGH THE FRAME'S OPENING



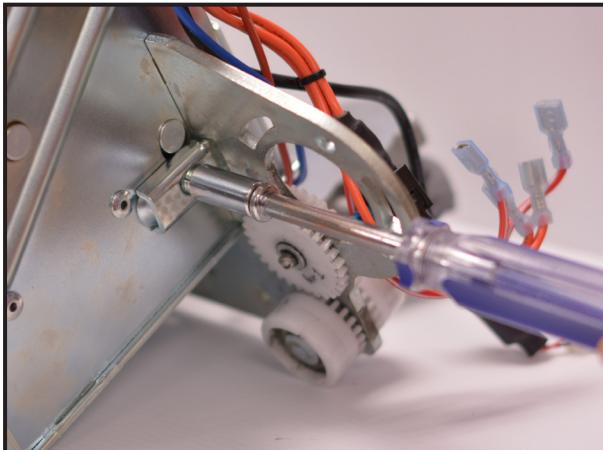
-Insert Limit kit assembly inside the Frame and make sure that the strap roller passes into the frame first and not at the same time as the Limit Kit.



-Once inside the frame, pull on the strap, while holding the Limit kit assembly. This will remove slack and tighten the strap around the drum.



-Insert the 12mm shaft through the frame into the strap roller.

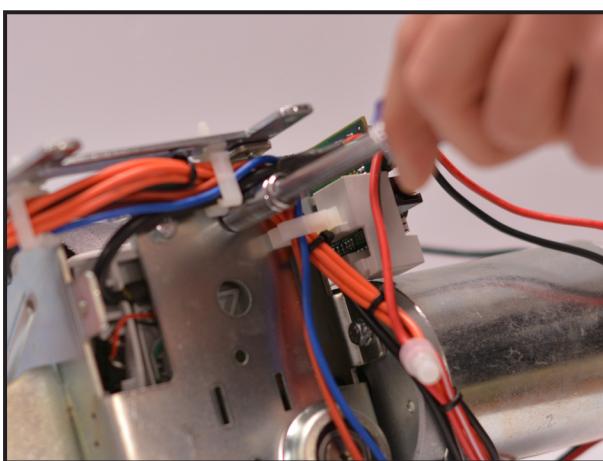


NOTE

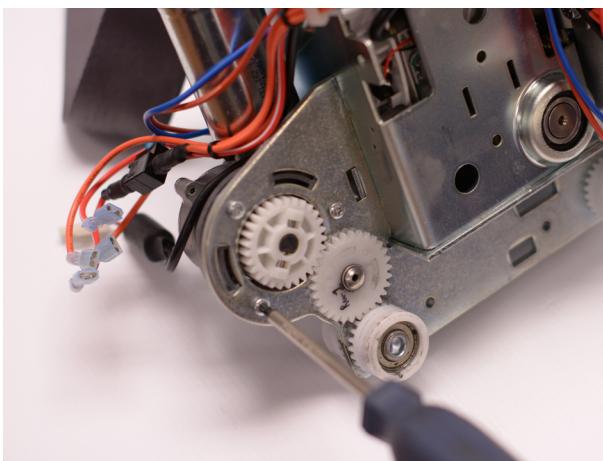
PULL ON THE STRAP TO INSERT THE TROLLEY LOCKER



-Mount trolley locker with M5 screw.



-Mount the Limit kit assembly with the two M5 screws.



-If necessary, install the left/right motor and screw the three Torx T20 screws.

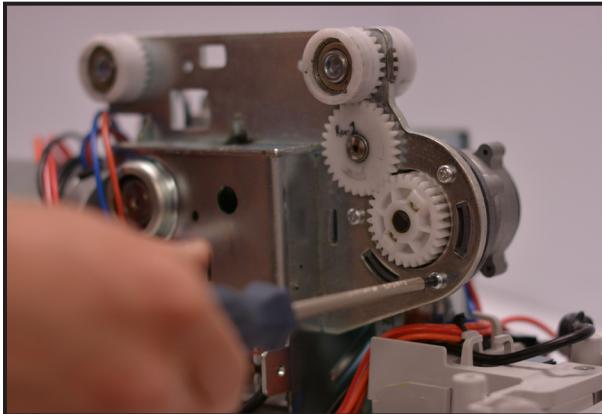


Refer to section "INSTALLING THE STRAP INLET", page 6-29

Refer to section "INSTALLING THE TOP CABIN", page 6-26

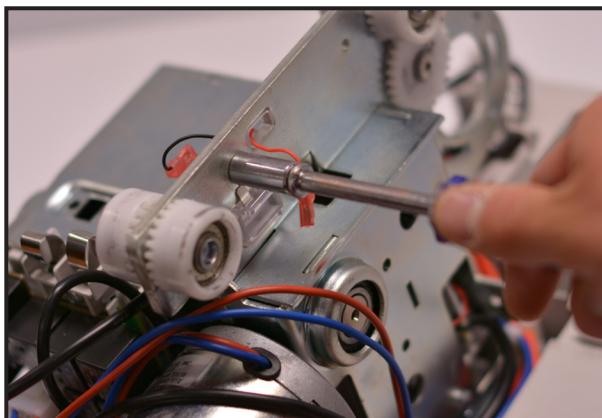
-Turn the lift ON by pushing on the red button and perform a functional test (refer to section "FULL FEATURE TEST", page 4-4 - item 5 for procedure).

REMOVING THE TROLLEY



Refer to section “REMOVING THE TOP CABIN”, page 6-25

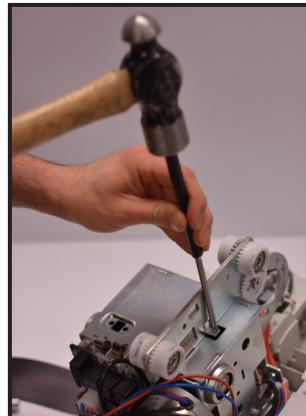
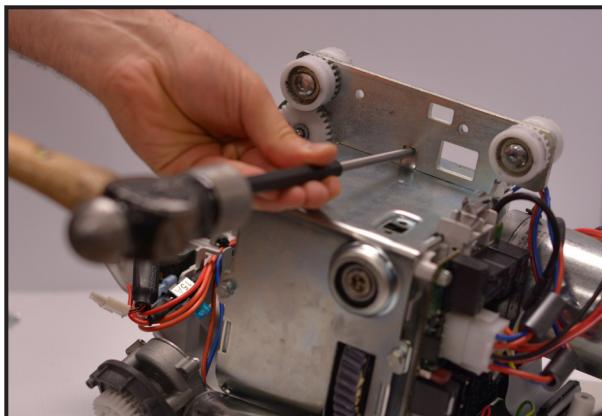
-If applicable (4-function unit), remove the Left/Right motor from the actual trolley (three Torx T20 screws).



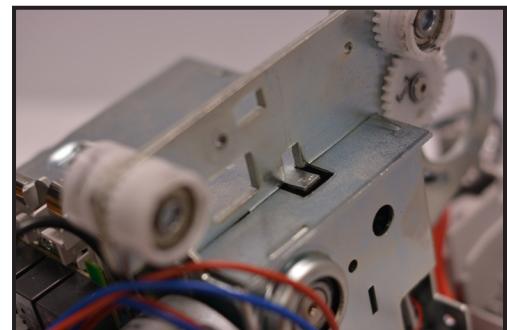
-If applicable (ECS unit). Remove the ECS components, including ECS trolley and plastic support. These will be reinstalled on the trolley later.

NOTE

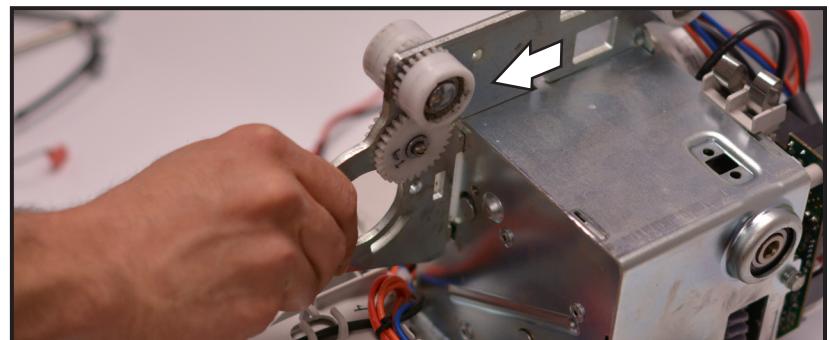
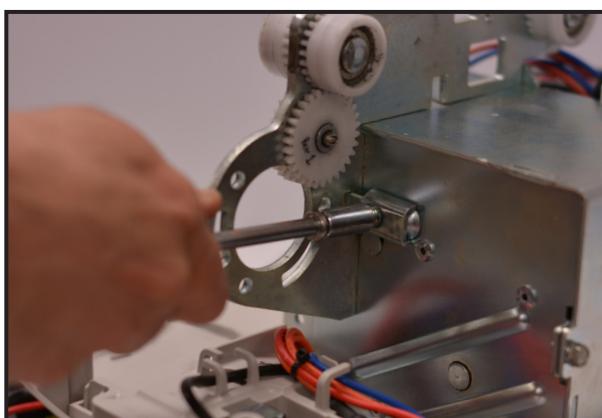
BE CAREFUL NOT TO DAMAGE THE ECS TROLLEY
WHEN DISCONNECTING THE WIRING



-Unbend the tab securing the trolley.



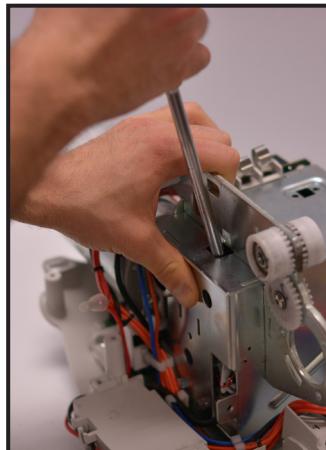
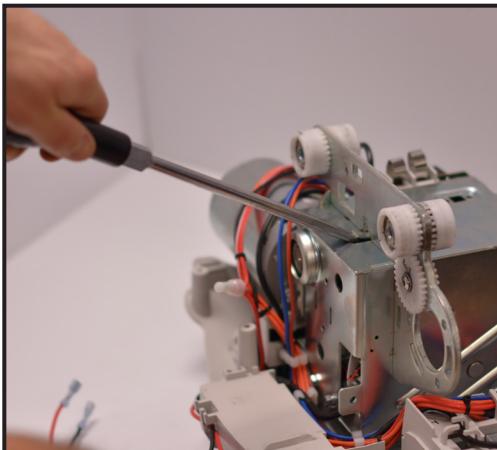
-Remove the trolley locker.
-Remove the trolley.



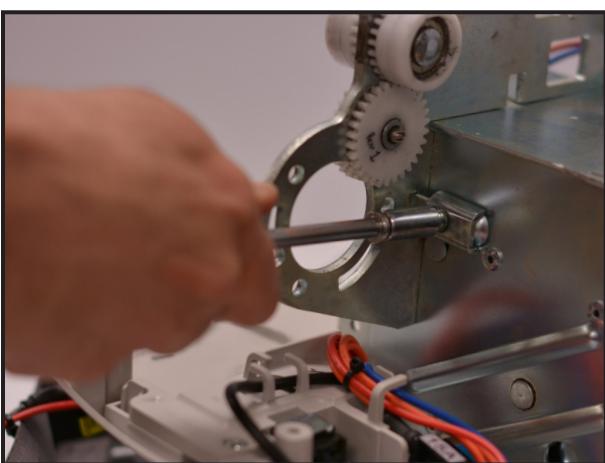
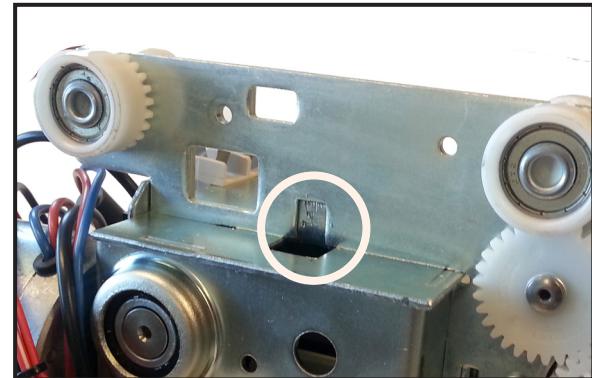
NOTE

DISPOSE OF THE OLD PARTS ACCORDING TO LOCAL REGULATIONS GOOD ENVIRONMENTAL PRACTICES.

INSTALLING THE TROLLEY



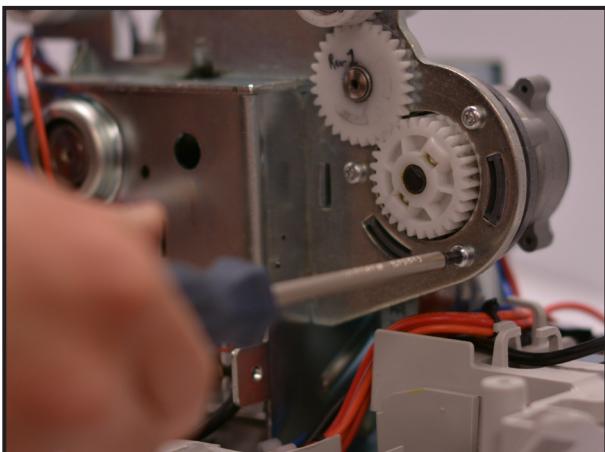
-Install the new trolley onto the transmission and bend the locking tab back as it was before.



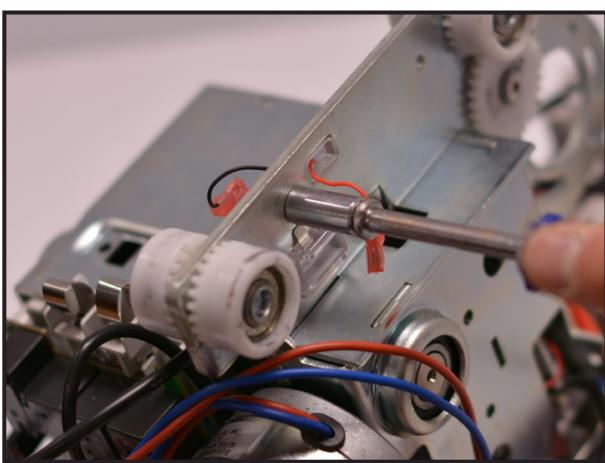
-Reinstall the trolley locker using the M5 screw.

WARNING

FAILURE TO USE THE TROLLEY LOCKER AND THE LOCKING TAB TO SECURE THE TROLLEY CAN LEAD TO A PATIENT FALL



-If applicable (4 functions unit), re-install the Left/Right motor.



-If applicable (ECS unit), re-install ECS assembly (refer to "INSTALLING THE ECS", page 6-23).

Refer to section "INSTALLING THE TOP CABIN", page 6-26

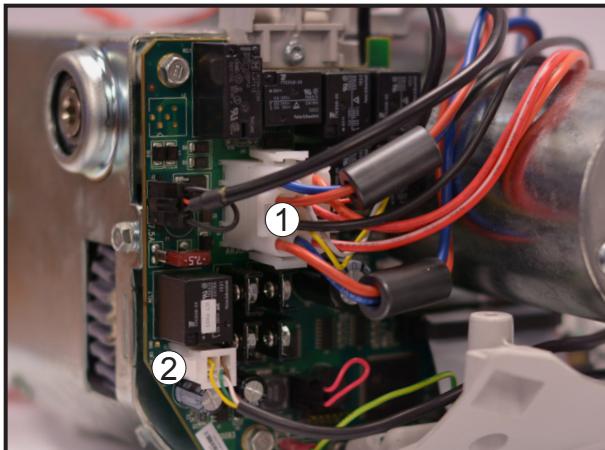
WARNING

WHEN HANDLING 4 FUNCTIONS MODEL ASSEMBLY, PAY ATTENTION TO PINCHING POINTS BETWEEN GEARS TO PREVENT INJURIES

-Turn the lift ON by pushing on the red button and perform a functional test (refer to section "FULL FEATURE TEST", page 4-4 for procedure).

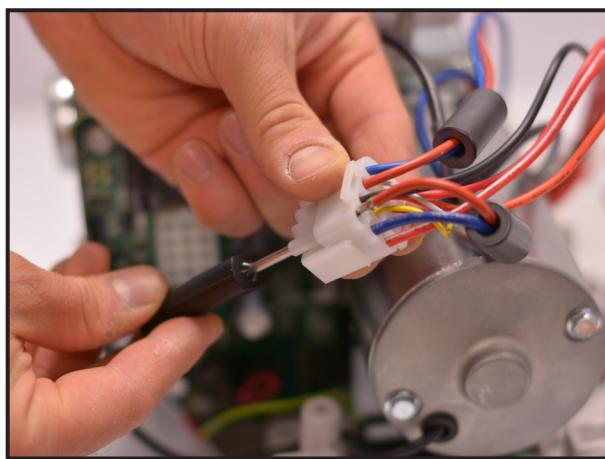
-Perform a safe working load test.

REMOVING THE UP/DOWN MOTOR

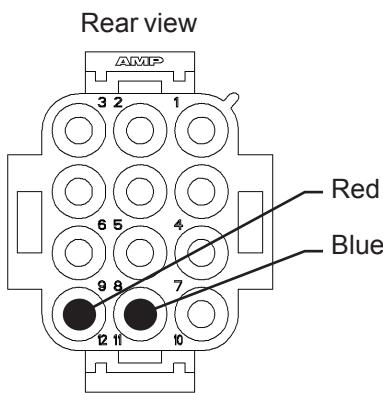


Refer to section “REMOVING THE TOP CABIN”, page 6-25

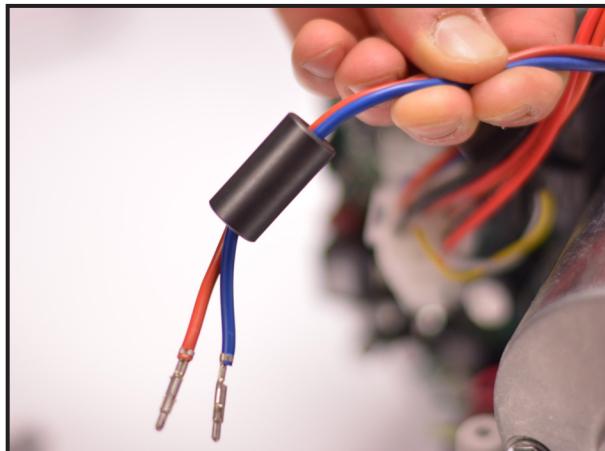
- Disconnect the 12 pins connector (1).
- Disconnect the 4 pins connector (Motor encoder) (2).



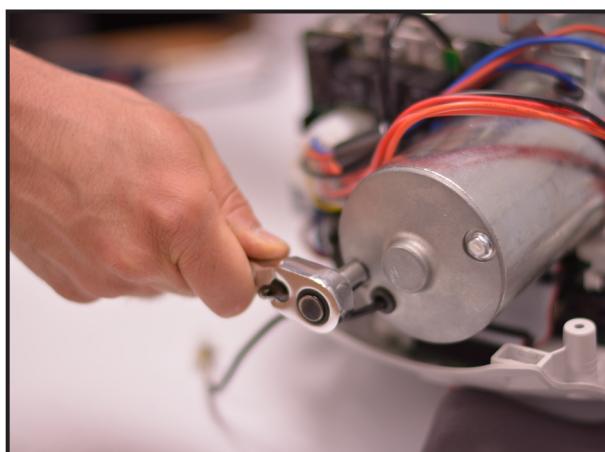
-Using a pin extractor, remove the pins at position 11 and 12.

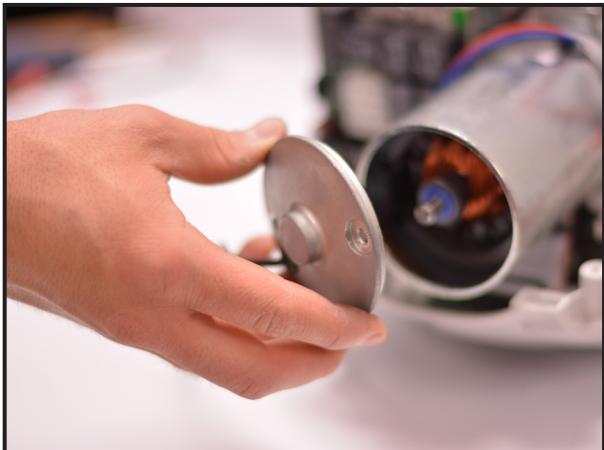


-Remove the ferrite and keep it for the new motor.

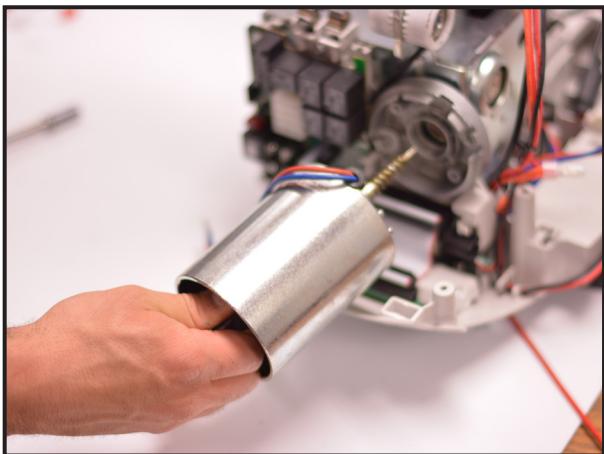


-Using an 8mm key, undo the two hex screws at the end of the Up/Down motor.





-Remove the back cover of the motor.

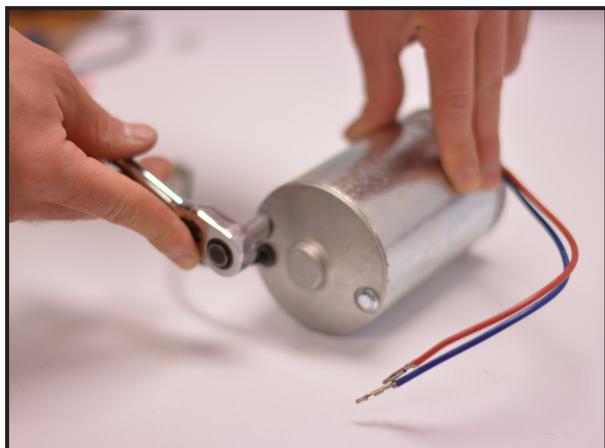


-Pull on the shaft to remove the motor from the lift. Only the aluminum flange will remain on the frame.

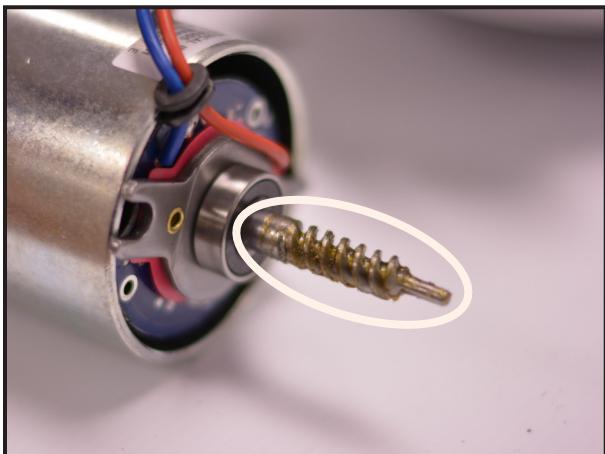
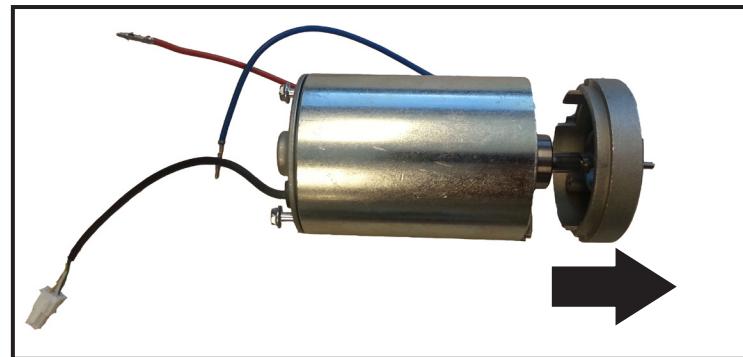
NOTE

DISPOSE OF THE OLD PARTS ACCORDING TO LOCAL REGULATIONS GOOD ENVIRONMENTAL PRACTICES.

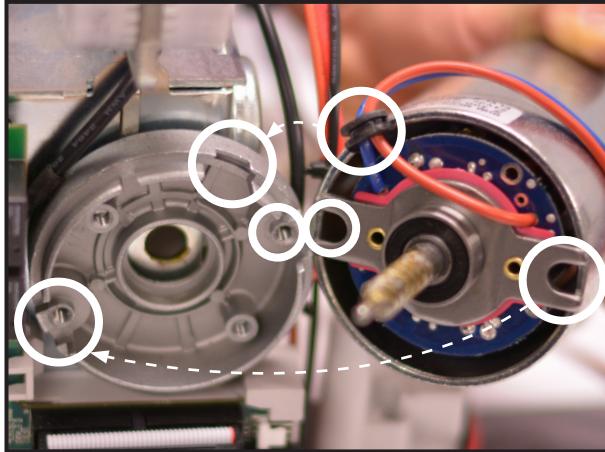
INSTALLING THE UP/DOWN MOTOR



-Unscrew the two hex screws at the end of the new Up/Down motor and remove the front flange.



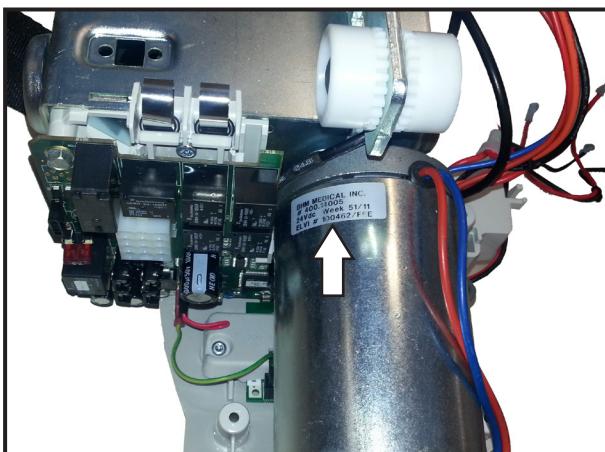
-Slightly apply grease (P8190) to the motor shaft.



-Insert the new Up/Down motor into the old flange on the frame.

NOTE

BE CAREFUL TO NOT PINCH THE WIRES BETWEEN
THE FLANGE AND THE MOTOR

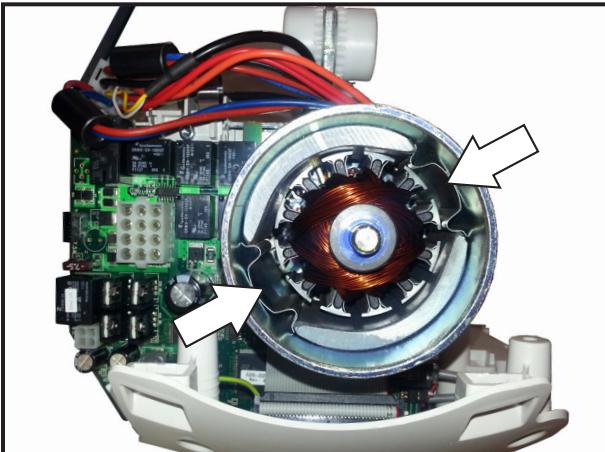


-Make sure to align the motor casing correctly.

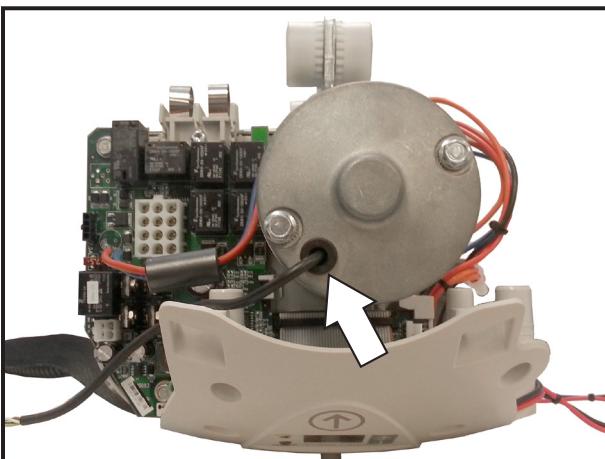
NOTE

IF THE MOTOR CASING IS ROTATED BY 180°,
THE UP/DOWN FUNCTIONS WILL BE INVERTED.

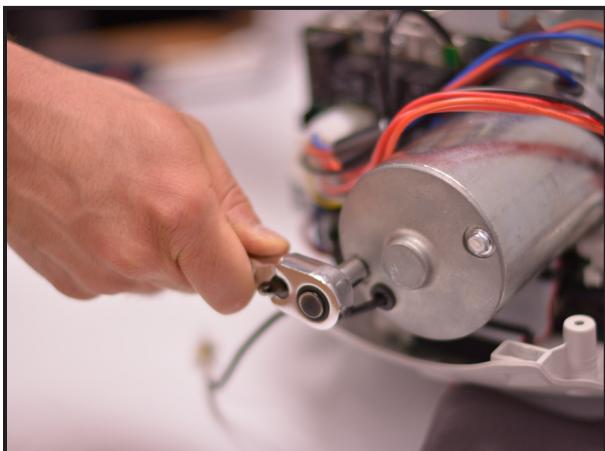
TO ASSURE THE POLARITY IS NOT INVERTED, MAKE SURE
THAT THE LABEL ON THE MOTOR CASING IS FACING UP AS
SHOWN.



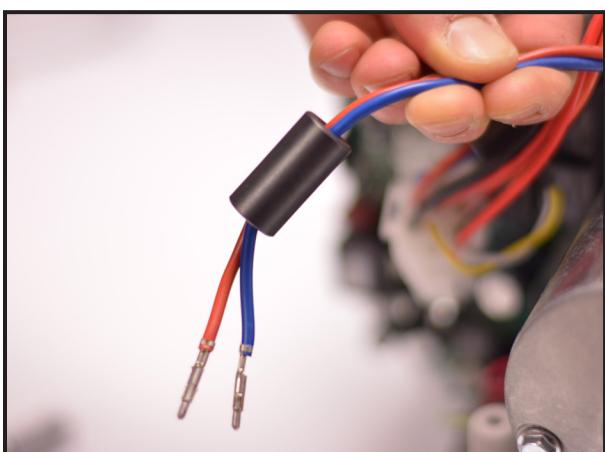
-The two screws of the back cover must pass in the area pointed by the arrows.



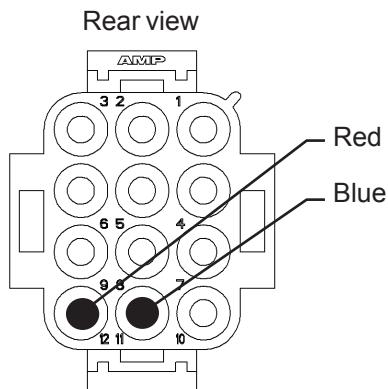
-Install the back cover of the motor with the two hex screws.
-The encoder wire shall be in the lower portion of the motor.



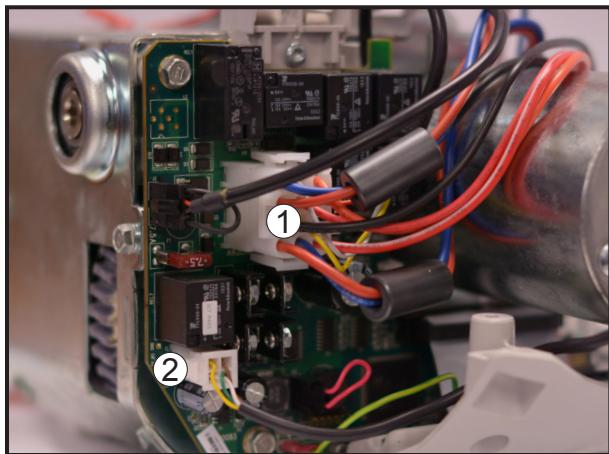
-Using an 8mm key, screw the two hex screws that pass through the Up/Down motor.



-Install the ferrite from the old motor.



-Insert blue wire into position 11 and the red wire into position 12 of the 12 pins connector.



-Connect the 12 pins connector to the main board (1).
 -Connect the 4 pins connector (Motor encoder) (2).
 -Place the ferrite close to the 12 pins connector.

Refer to section "INSTALLING THE TOP CABIN", page 6-26



-Turn the lift ON by pushing on the red button and perform a functional test (refer to section "FULL FEATURE TEST", page 4-4 - Item 3 for procedure).
 -Perform a safe working load test.

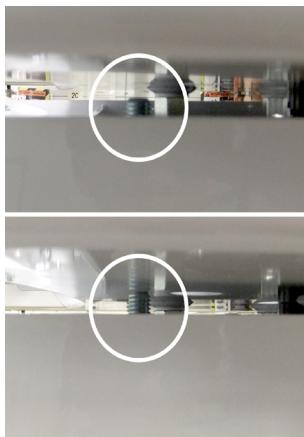
INTRODUCTION TO MAINTENANCE AND REPAIR FOR *Maxi Sky 2 PLUS***WARNING**

Before performing any type of maintenance on the *Maxi Sky 2 Plus*, user shall lock the rotation of the bottom plate of the MS2 Plus trolley by tightening the set screw with a six mm Allen key. This set screw is located above one of the ceiling lifts. Tilt the ceiling lifts to locate it. Once the maintenance is completed, do not forget to unlock the bottom plate by unscrewing the screw.



-The key hole is hidden above one of the ceiling lifts. Tilt the ceiling lift to locate it.

- Insert a 6 mm Allen key into the hole in the trolley and turn set screw clockwise to lock it.



-Tighten the set screw so that the bottom plate of the trolley will not swivel.

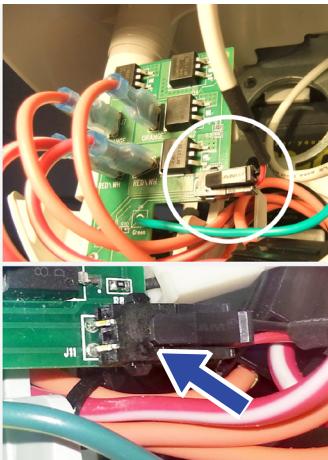
The trolley should not be able to rotate freely.

REPLACEMENT OF ONE OF THE MS2 PLUS CEILING LIFTS

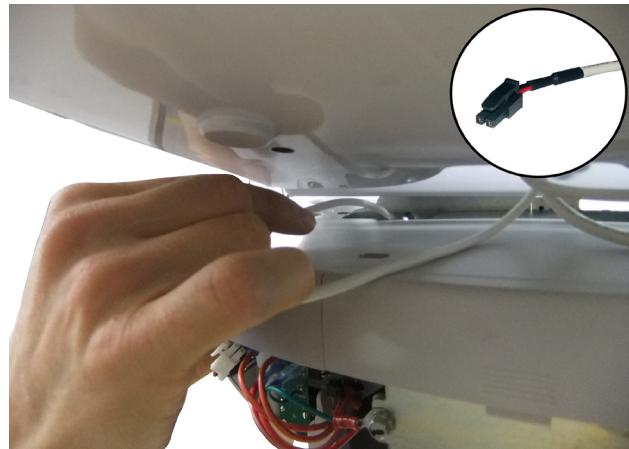
First of all, ensure that the software revision of the new lift that will be inserted in the *Maxi Sky 2 Plus* is equal or higher than 3.0.41. If the revision is lower, the software will not be compatible with the *Maxi Sky 2 Plus* configuration. Refer to section 4-7 of this document for SW version determination.

Pull on one of the emergency stop cables to shut down both ceiling lifts.

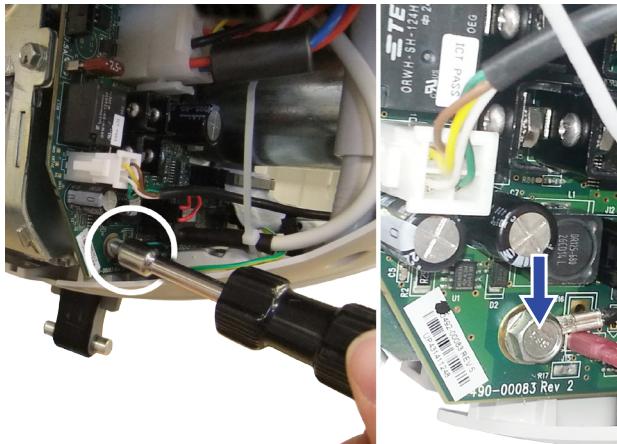
Remove the spreader bar, refer to section 6-3 of this document.



-Unplug the emergency stop harness from the circuit board.



-Pull out the emergency stop harness from the ceiling lift enclosure.



-Using a 8 mm wrench unscrew the M5 bolt that holds the ring terminal of the serial communication cable.



-Cut the tie wrap that holds the serial communication cable and unplug it.

Unplug the swivel connection cable. Depending if the *Maxi Sky 2 Plus* is ECS or C-Stat, the cable can be unplugged from two different locations.



C-STAT Configuration

-For C-STAT configuration unplug the swivel connection cable from the 12 pin connector using the pin extractor. Refer to section 6-31.



ECS Configuration

-For ECS configuration unplug the cable from the connector J2 on main board.

-Pull out both the serial communication cable and swivel connection cable from the ceiling lift enclosure.



-Remove the screw that locks the ceiling lift in place.



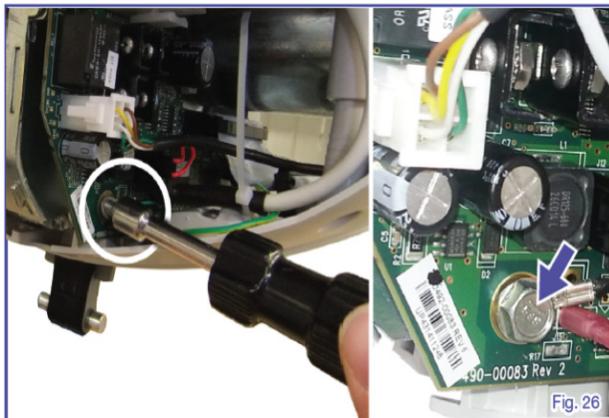
-Pull up on the lock located on the top of the trolley. The lock is unlocked when it is in its full upright, vertical position.



Remove the ceiling lift by sliding it towards your right. Be careful and grip the ceiling lift firmly with both hands because after about one inch (25 mm) of travel the lift will fall out of the trolley.

To install the new ceiling lift, reverse the above procedures. Refer also to 001-31229-EN "Initial Start Up" beginning at section 5.

INVERTING THE LEADING HOIST WITH THE DRIVEN HOIST



Using a 8mm wrench, unscrew the M5 bolt that holds the ring terminal of the serial communication cable.



Cut the tie wrap that holds the communication cable and unplug it.

Make sure that the two lifts are on by pushing in both emergency stop buttons. An error code “24” will appear on screen, ignore this error.



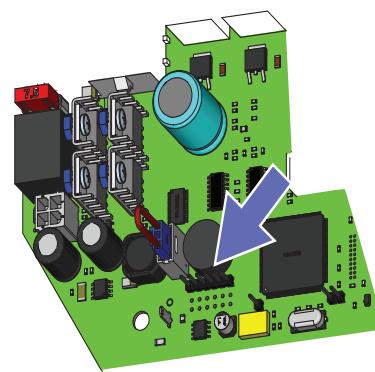
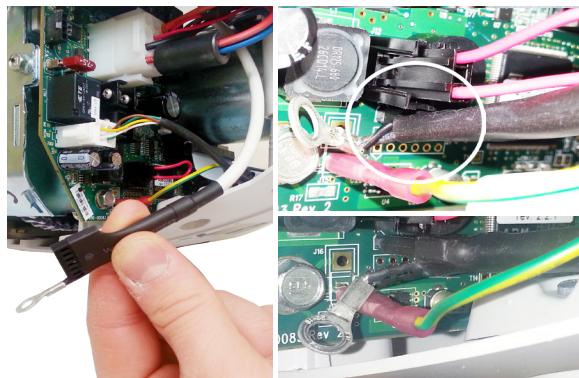
Set the ceiling lift in single mode. To do this, access the customizing menu by pressing and holding the **i** button for five seconds.

Using the **↓** and **↑** buttons to navigate through the menu. Select the “Dual / Single Mode” menu and press the **i** button. Select “Single” and confirm by pressing the **i** button.

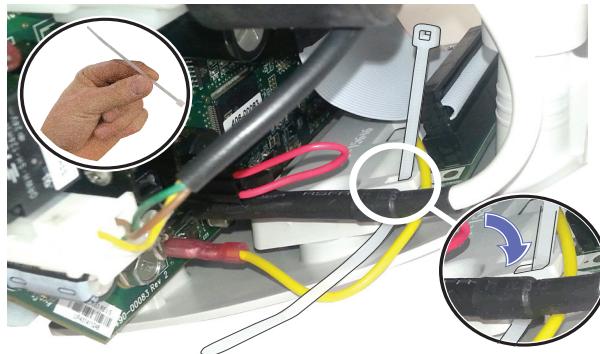
To confirm that this step has worked, exit and go back to customizing menu, "Dual / Single Mode" will no longer appear in the list of customizing menu. This means the former leading ceiling lift now behaves like a standalone MS2.

Pull on one of the emergency stop cables to shut down both ceiling lifts.

Unplug the hand control from the former leading ceiling lift and plug it into the other ceiling lift. Refer to the "Wired hand control removal" and "Wired hand control installation" sections of this manual.



Plug the communication cable back in that was unplugged earlier in these procedures.



Gently pull the cable towards the bottom of the ceiling lift and plug the cable into the main board as shown.



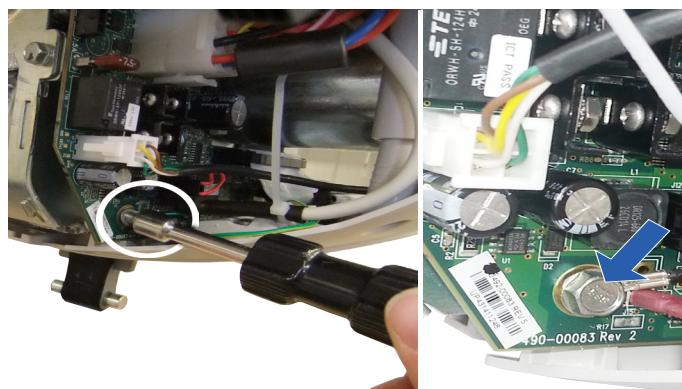
Secure the cable with a new plastic tie wrap.

-First insert the tie-wrap in the slot shown in the picture at left.

-Firmly plug in the connector.

-Tighten tie-wrap and trim off excess.

NOTE: When inserting the tie-wrap do not include the yellow ground wire as well. See picture at left.



-Remove the nearby bottom screw that secures the circuit board using a 8 mm socket.

-Insert the ring terminal onto the screw and reinstall to the frame. Tighten screw and ensure orientation is as shown in picture at left.

NOTE: Hold the ground wire ring terminal in place while tightening the screw.

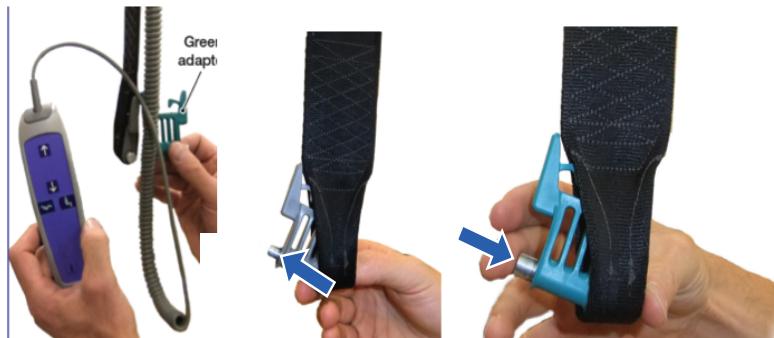
Make sure that the two lifts are on by pushing in both emergency stop buttons.



Set MS2 Plus in dual mode. To do so, access the customizing menu by pressing and holding the **i** button for three sections.

Using the **↓** and **↑** buttons to navigate through the menu. Select the “Dual / Single Mode” menu and press the **i** button. Select “Dual” and confirm by pressing the **i** button. Select “back” and press the **i** button to exit menu.

Remove the spreader bar.



On the new leading ceiling lift (the one with the hand control) remove the grey strap interface and install the green strap interface taken from the other ceiling lift. The green strap interface needs to be on the leading ceiling lift.



Reinstall the spreader bar taking care of matching the green strap interface with the spreader side that has the green dots.

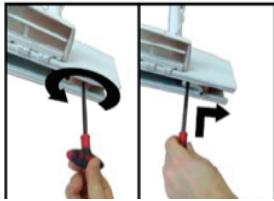
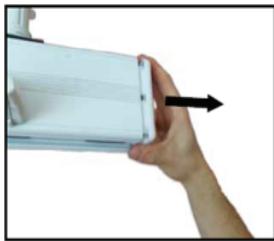
Reference 001-31229-EN MS2 Plus “Initial Start Up” and perform “Testing the MS2 Plus system” section 14.

REPLACEMENT OF THE MS2 PLUS ECS TROLLEY

The MS2 PLUS can stay supported by tracks when servicing ECS.

The MS2 PLUS will have to be partially extracted from the tracks in order to gain access to ECS trolley.

-Pull one of the emergency stop cables to shut down both ceiling lifts.



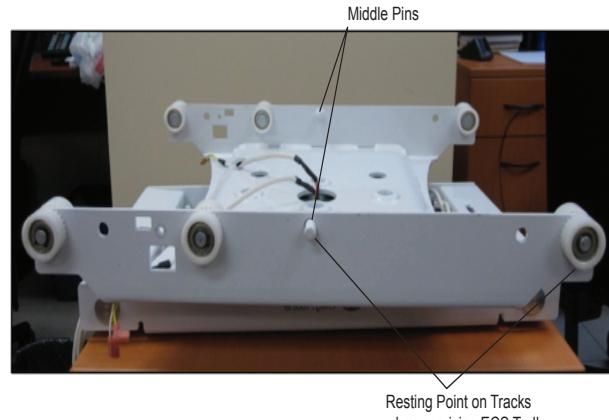
Remove end stopper at the end of both tracks.

-Unscrew the end stopper on the rail using a 6 mm Allen key.
-Press inside the hole to remove end stopper.



You must choose the good end of the track, the one that is on the same side as the ECS trolley. This makes it possible to rest the trolley on one set of wheels and the middle pins.

Mobile plate must be locked in the position shown at left.



-Bring the *Maxi Sky 2 PLUS* to the end of the tracks and slowly extract it. Once the front sets of wheels (the two sets of wheels closest together) of the ECS trolley are free of the tracks, the *Maxi Sky 2 PLUS* will drop down a few inches but will still be supported by the middle pins and the back set of wheels.



Once both ECS trolleys are accessible, unplug all cables connected to the ECS trolley.

Replace ECS trolley. When connecting the yellow and white wires, locations are not critical, the wires may be connected on either side.

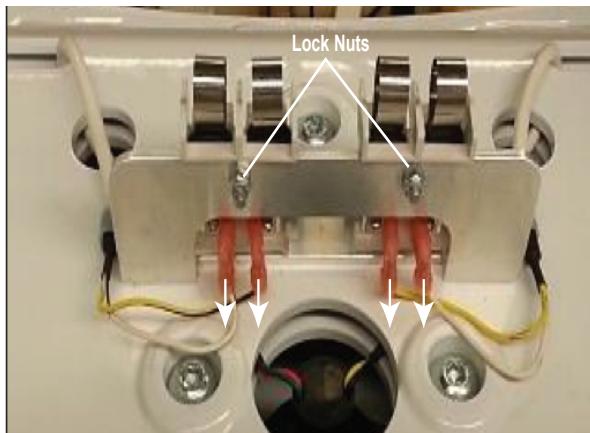
Once the new ECS trolley electrical cables are connected, reinsert the MS2 PLUS back into the tracks. Be very careful to align the ECS brushes with their respective copper strips.

Ensure both track stoppers are reinstalled and torqued to 20 Nm.

Make sure the two ceiling lifts are “On” by pushing in both emergency stop buttons.

Perform the test #10 B of section 14 “Testing the *Maxi Sky 2 PLUS* system” of 001-31229-EN MS2 PLUS Initial Start Up.

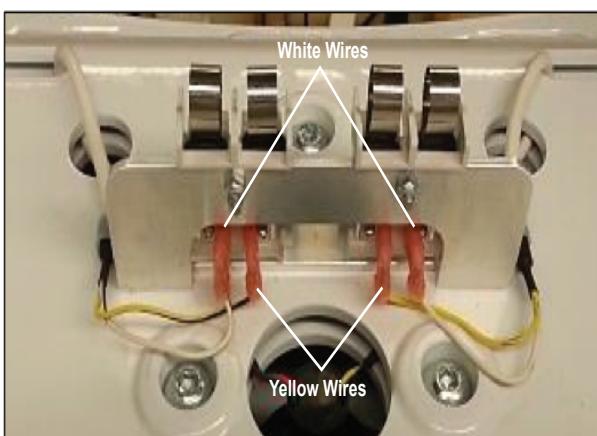
REPLACEMENT OF MS2 PLUS CONTACT BLADES



Pull on one of the emergency stop cable to shut down both lifts. Unplug all four wires connected to the contact blade.

A pair of needle nose pliers may help to unplug the connectors.

Using a 7 mm wrench, unscrew the two lock nuts.



Remove the two M4 screws and the two contact blades.

-Install the two new contact blades kit with the supplied M4 screws. Slightly torque the new lock nuts. Do not over tighten the lock nuts because damage could occur to the plastic of the contact blades.

-Connect the wires to the contact blades with the yellow wires connecting to the inside terminals and white wires connected to the outside connectors.

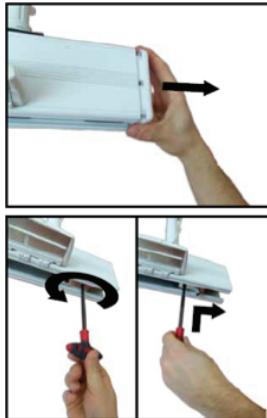
Make sure the two ceiling lifts are “On” by pushing in both emergency stop buttons.

Perform the test #10 B of section 14 “Testing the *Maxi Sky 2 PLUS* system” of 001-31229-EN MS2 PLUS Initial Start Up.

Replacement of MS2 Plus Cables

Remove both ceiling lifts from the *Maxi Sky 2 Plus* trolley. Refer to section “How to Replace Ceiling Lift in Trolley”.

Lock bottom trolley before beginning repair.

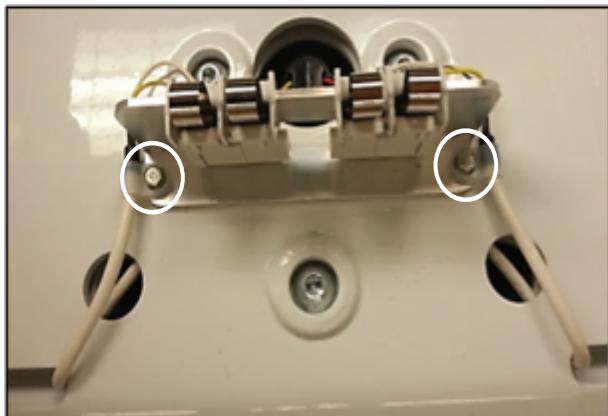


Remove the end stopper at the end of both tracks.
 -Unscrew the end stopper on the rail using a 6 mm Allen key.
 -Press inside the hole to remove end stopper.

WARNING

Carefully remove the *Maxi Sky 2 Plus* trolley from the rail and place it on a flat surface.

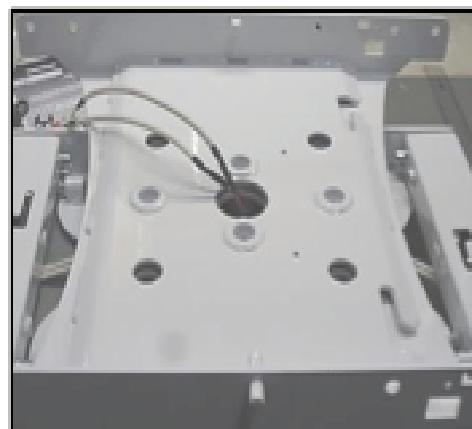
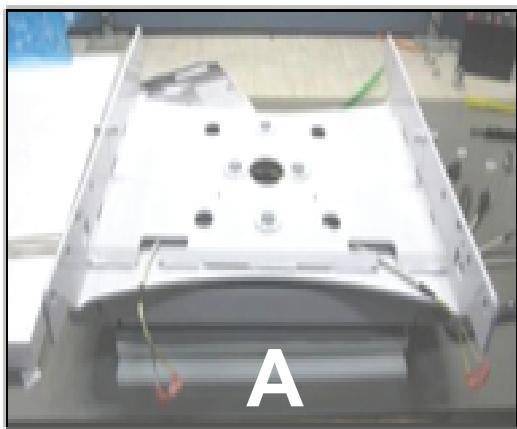
The MS2 Plus trolley is heavy, weighing 27 kg (60 lb). Therefore it is recommended that two people perform this step.



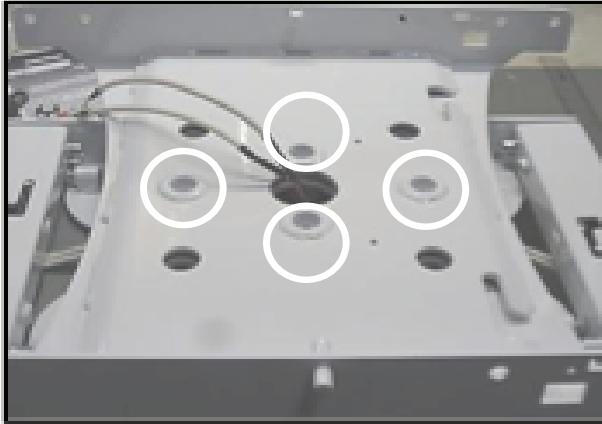
Unplug the wires from the ECS trolley and unscrew the cable holder.

Undo the cables from the top plate, ensure no damage to connectors occurs during this step.

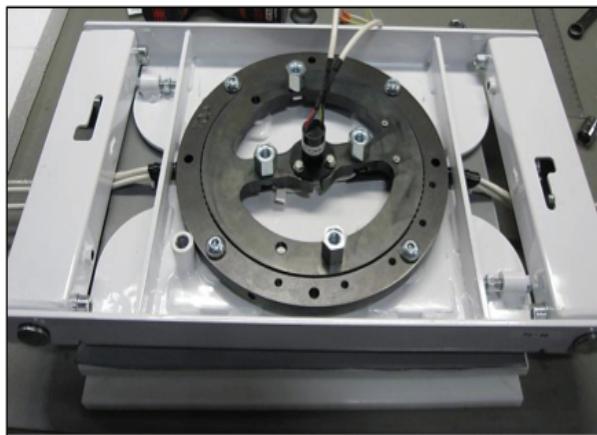
Beginning reference graphic A



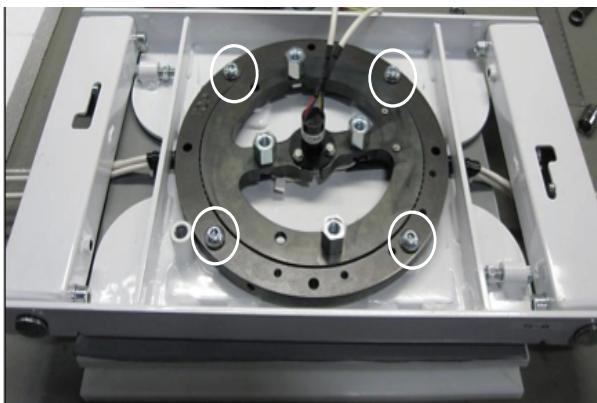
Finishing reference graphic B



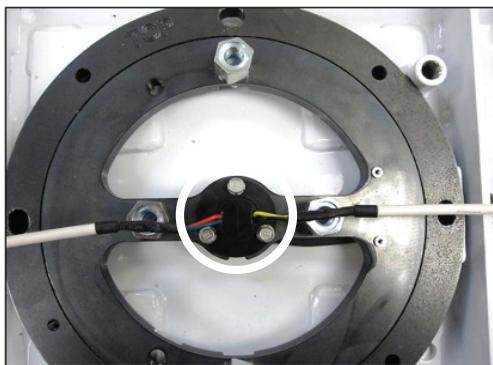
Using a 6 mm Allen key, undo the four screws that hold the top plate.



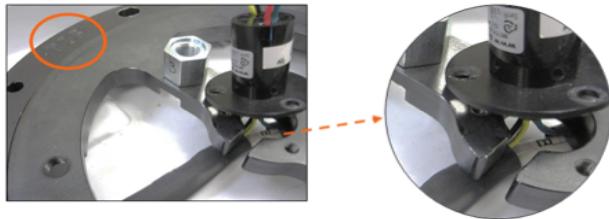
Remove the top plate. Be careful since the wires are still attached to the bottom plate.



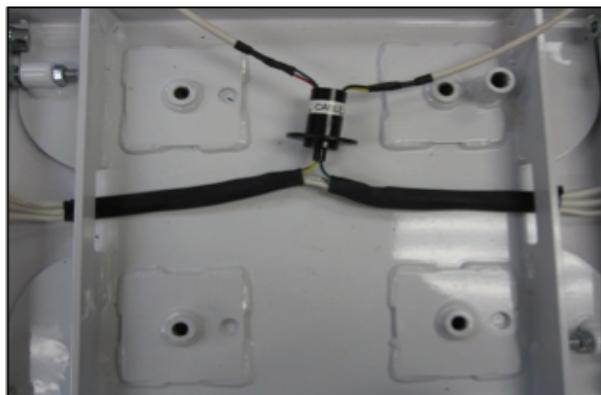
Using a 6 mm Allen key, undo the four screws that hold the bearing in place.



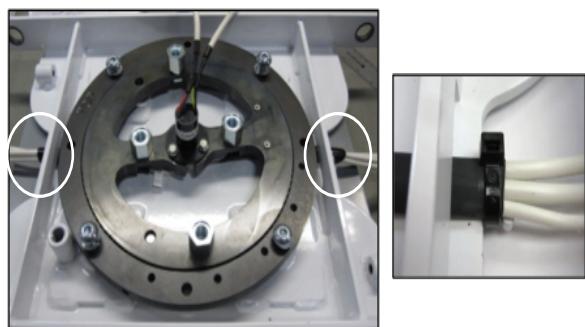
Using a 8 mm hex socket, undo the three screws that hold the swivel connector to the bearing.



Slide the swivel connector out of the bearing.

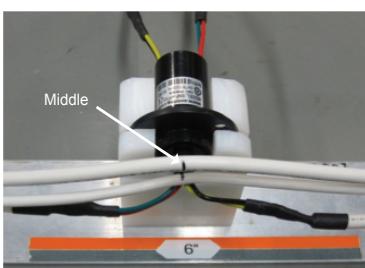


Remove the bearing.



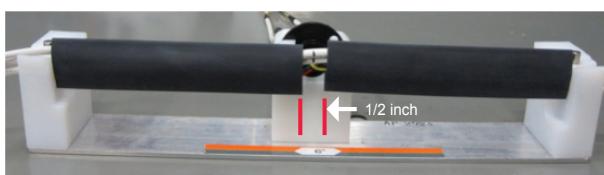
Cut the two tie wraps that hold the cables at the extremity of the bottom plate.

Remove all cables from the assembly.



Take the new cables and place them side by side. Identify the middle of each cable and align the middle point with the center of the swivel connector. Slide the heat shrink tubes over the cables from each end and slide the heat shrink tubes to where they meet at the middle of the cables. Then slide the heat shrink tubes back from center just enough to allow 1/2 in (13 mm) gap between the tubes.

Heat the shrink tubes.



Reverse these instructions in this section to reassemble.

Ensure all 6 mm Allen key screws are torqued to 34-38 Nm.

PERFORMING A WEIGHT LOAD TEST

Load test at SWL on lift and track.

As stated in the *Maxi Sky 2 and Maxi Sky 2 Plus Instructions for Use*, it is recommended to perform a load test on the ceiling lift and track at its safe working load (SWL). This annual verification should verify the following aspects:

- The track system, including its anchors, are still performing as intended and are secure.
- The unit is able to mechanically raise the SWL.
- The batteries are still in good condition and are able to raise the SWL.

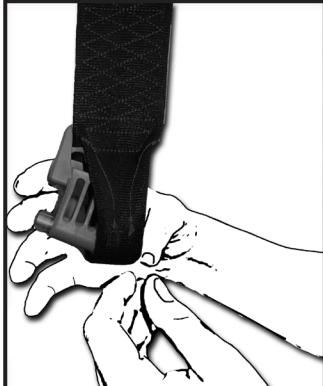
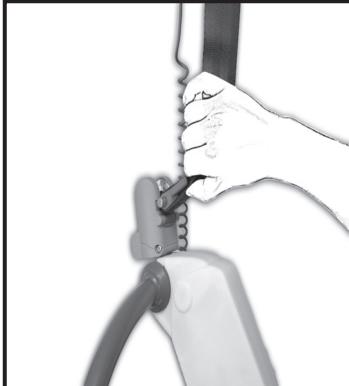
This test should be performed as per 001-11760-EN, Functional Load Test section. MS2 Plus, for load distribution on leading and driven ceiling lift, refer to MS2 Plus IFU 001-31228 or 001-31249, Preventative Maintenance Schedule section.

Load test on track with deflection measurement when under load.

This test should be performed per 001-11760-EN “Certified Load Test” section.

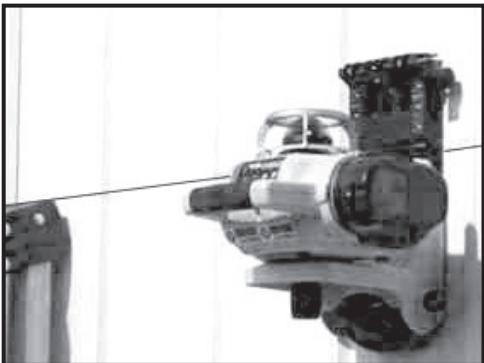


-Prepare the weight load test trolley (WLT) and make sure it is going to be able to bear the weight load once it is suspended.



If using the ceiling lift to conduct the test:

- Remove the spreader bar from the ceiling lift.
- Remove the spreader bar quick connect adaptor from the strap.



-Install a rotating laser on a stable location 15 cm (6 in) - 30 cm (12 in) lower than the bottom of the tracks.

Make sure that the reference line is level.



-Using a measuring tape, measure between the track and the laser line at every load test point, always taking the same reference point (either the top or the bottom of the track).

NOTE

BE SURE TO USE THE SAME MEASURING TAPE THROUGHOUT, AS DIFFERENT MEASURING TAPES MAY HAVE VARYING LOOSENESS IN THEIR TAPE END HOOKS.



-With the measurements mentioned above, fill the corresponding column (height unloaded) in the weight load test form (001-11760-EN).

NOTE

REGULATORY AUTHORITIES REQUIRE THE ARCHIVING OF WEIGHT LOAD TEST DOCUMENTS FOR FUTURE CONSULTATION.



If using the ceiling lift:

-Connect the ceiling lift strap to the WLT trolley using a carabiner.

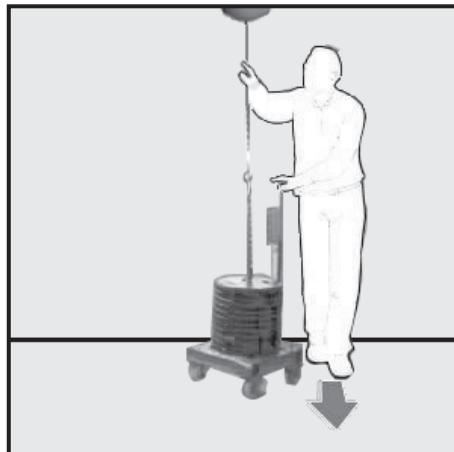


-DO NOT MOVE YOUR LASER.

LIFT the WLT trolley no more than 50 mm (2 in) from the floor to make sure it no longer touches it.

WARNING

NEVER STAND WITH YOUR FEET UNDER THE TROLLEY DURING THE WEIGHT LOAD TEST.



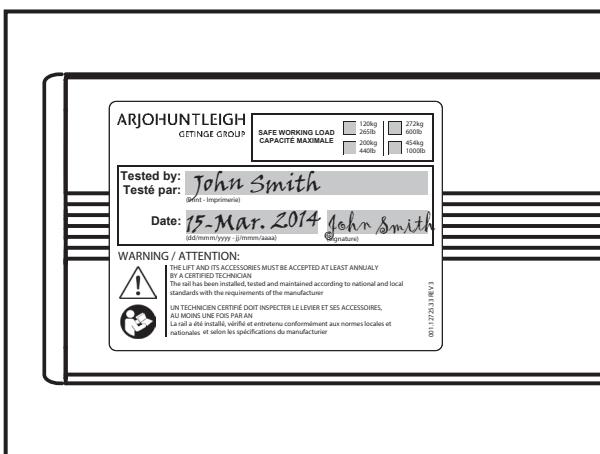
-Take measurements of the height of the track versus the laser line as you pass under each load test point.



-With the measurements mentioned above, fill the corresponding column (height loaded) in the weight load test form.

-Compare the measurements of the track height when loaded and unloaded. Calculate the difference (deflection) and complete the appropriate column in the form.

Keep the completed form in order to archive it with the project file.



-Fill out the weight load test sticker (#001.12725.33) and apply it properly on the most visible side of the track, nearest to the transfer location

VERIFYING THE SOFT START AND STOP FEATURES

Testing the Ceiling Lift



Without Load:

-Press the DOWN button on the hand control. Observe as the vertical motor unravels the strap. The motor should not reach its top speed instantly. Top speed should be achieved only after approximately 1 second of time has elapsed.



With Load:

-Attach the WLT trolley to the ceiling lift (see "PERFORMING A WEIGHT LOAD TEST", page 6-69)

-Press the UP button on the hand control. Observe as the vertical motor winds up the strap. The motor should not reach its top speed instantly. Top speed should be achieved only after approximately 1 second of time has elapsed.

-If the soft start and stop feature does not operate as described, replace the circuit board (please refer to the "REMOVING THE USER INTERFACE BOARD", page 6-37).

VERIFYING THE EMERGENCY STOP FEATURE



-Attach the WLT trolley to the ceiling lift (see "PERFORMING A WEIGHT LOAD TEST", page 6-69)

-Raise the WLT trolley up to no more than 30 cm (1 ft) with the UP button on the hand control.

-While keeping the UP button pressed, pull on the red emergency stop cord. The ceiling lift should shut down and the raising action should cease.

VERIFYING THE LIFTING CAPACITY OF THE CEILING LIFT

Raise the SWL trolley roughly 30 cm (1 ft) off the floor and wait 5 seconds.

- If you hear the current limiter signal, then the current limiter needs adjusting. Refer to "ADJUSTMENT OF THE CURRENT LIMITER ON MS2", page 5-5

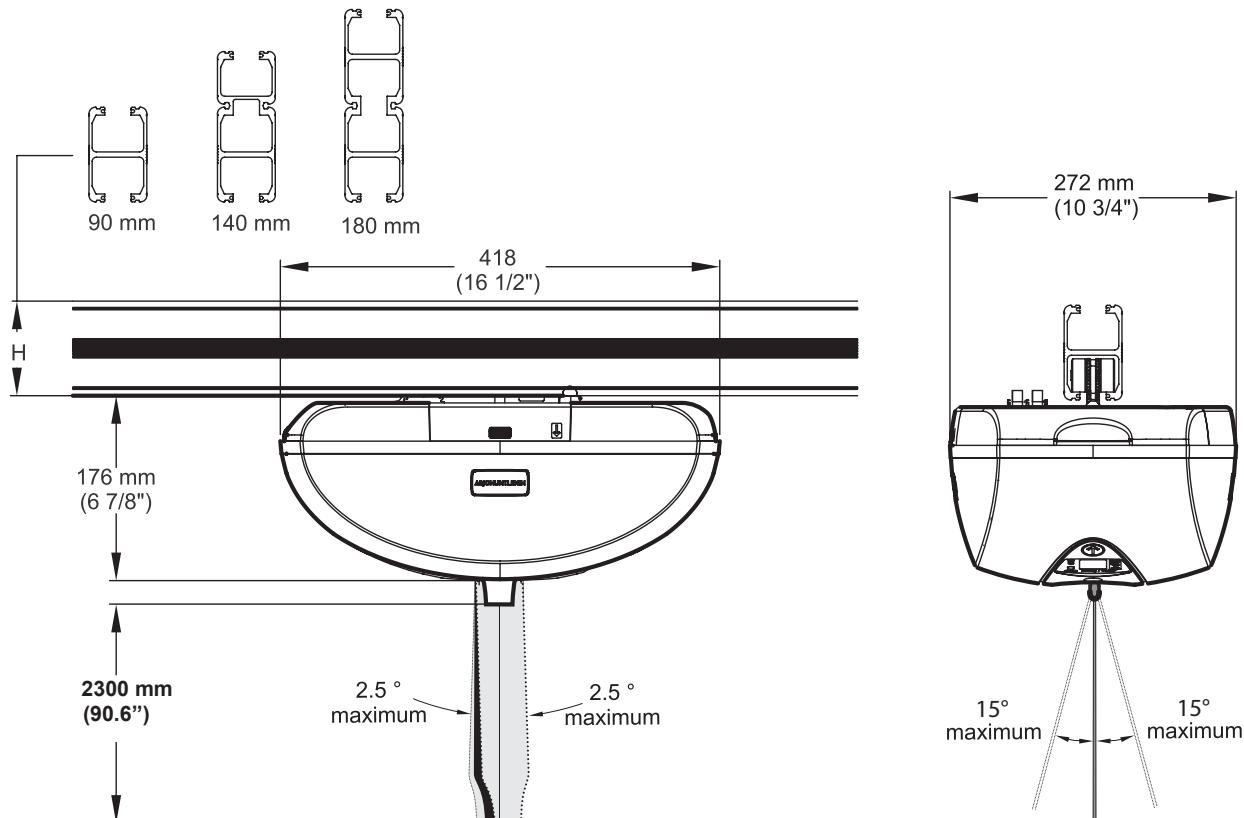
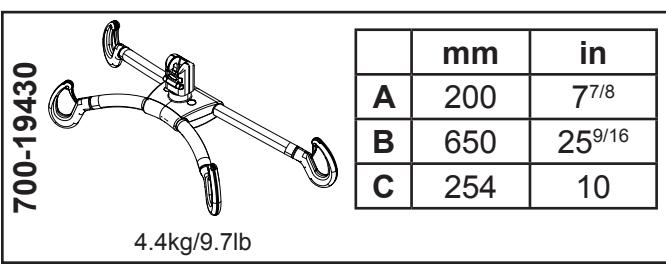
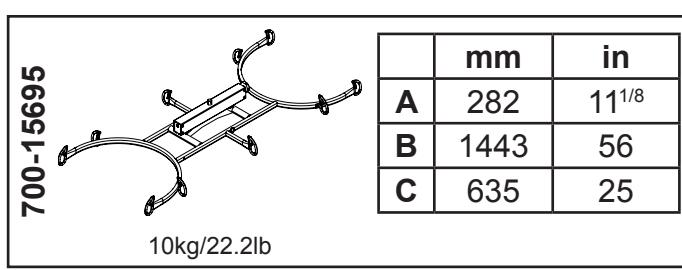
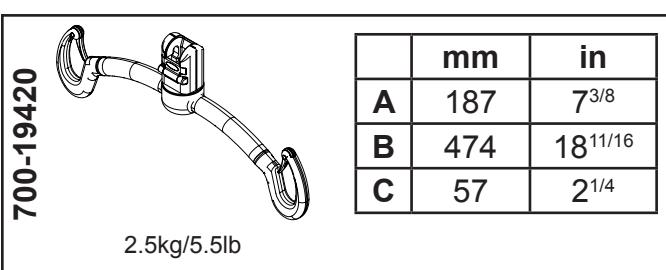
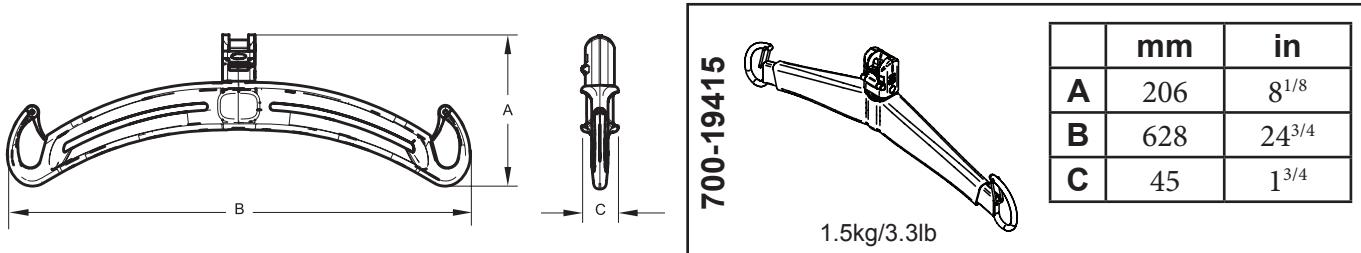
- If you hear the low battery signal, then ensure that the batteries are fully charged and repeat the test to determine if the batteries need replacing.

TECHNICAL SPECIFICATIONS

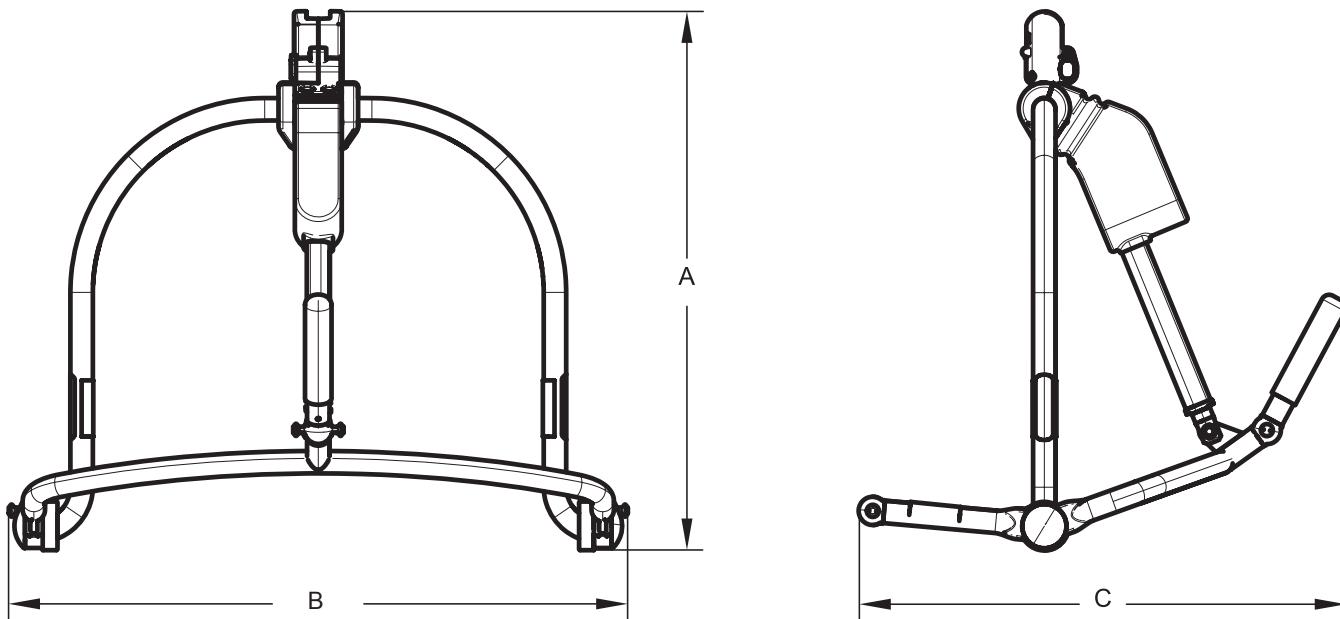
7

TECHNICAL DIMENSIONS AND SPECIFICATIONS	2
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MAIN PCB	8
TEST POINTS	8
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<i>MAXI SKY 2 PLUS (C-STAT) WIRING DIAGRAM</i>	11
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TECHNICAL DIMENSION AND SPECIFICATION

THE MAXI SKY 2 LIFTLOOP SLING SPEAKER BARS

DYNAMIC POSITIONING SPREADER BARS



700-19475

3.4kg/7.5lb

	mm	in
A	194	7 ^{5/8}
B	552	21 ^{11/16}
C	638	25 ^{3/16}

700-19350

7.9kg/17.4lb

	mm	in
A	610	24
B	620	24 ^{3/8}
C	547	21 ^{1/2}

700-19480

5.7kg/12.5lb

	mm	in
A	604	23 ^{3/4}
B	582	22 ^{15/16}
C	503	19

700-19355

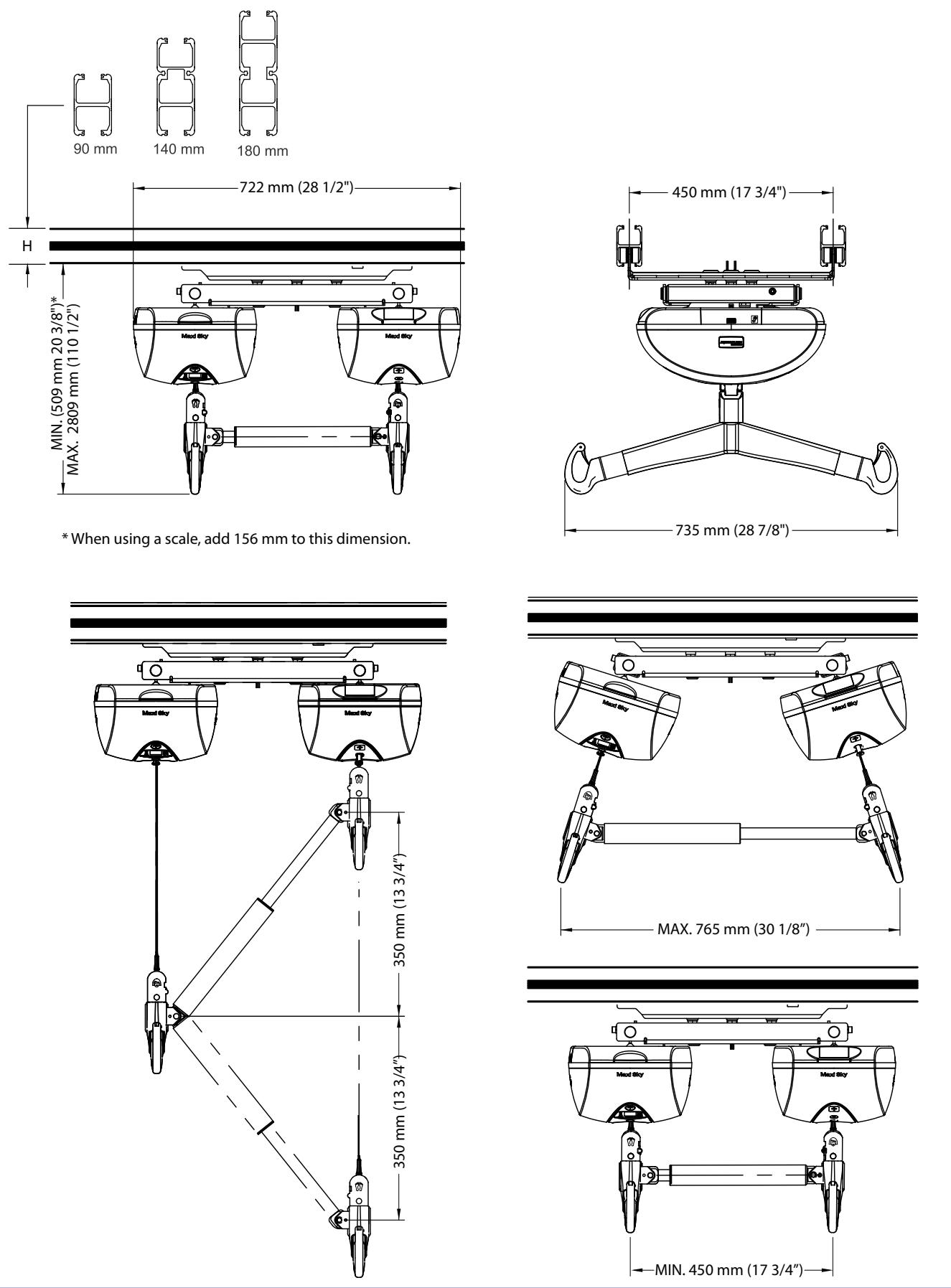
8.4kg/18.5lb

	mm	in
A	610	24
B	700	27 ^{1/2}
C	547	21 ^{1/2}

SCALE

Model	700-19485	700-19490
Type	Standard	Class III
Dimensions	52mm x 156mm (2" x 6")	52mm x 156mm (2" x 6")
Weight	0.76kg/1.7lb	0.76kg/1.7lb

THE MAXI SKY 2 PLUS LIFT



TECHNICAL DATA

MAXI SKY_2

GENERAL

Weight, complete (Four-function model)	12.3 kg (27 lb)
Weight, complete (Two-function model)	11.6 kg (26 lb)
Lifting capacity	120 kg (265 lb), 200 kg (440 lb), 272 kg (600 lb)
Strap length	2500 mm (98.4 in)
Lifting speed	5.1 cm/s (2.0 in/s) without load 4.2 cm/s (1.7 in/s) at 120 kg (265 lb) 3.8 cm/s (1.5 in/s) at 200 kg (440 lb) 3.3 cm/s (1.3 in/s) at 272 kg (600 lb)
Maximum stroke (from ceiling)	2300 mm (90.6 in)
Horizontal displacement speeds	10, 15 and 20 cm/s (4, 6 and 8 in/s)
Operating force of control	< 5 N

ELECTRICAL

Duty cycle	Up/Down Motor: Max 10%, 1 minute continuously Left/Right Motor: Max 20%, 5 minutes continuously Sit/Reclined Motor: Max 10%, 2 minutes continuously
Horizontal axis motor	24 VDC, 62 watts
Vertical axis motor	24 VDC, 110 watts
Rating	24 VDC, 15 A max.
Noise level for either raising or lowering	61 dBA max. (with or without load)
Medical equipment	Type BF protection against electrical shock in accordance with IEC 60601-1

WARNING: Wireless communications equipment such as wireless home network devices, mobile phones, cordless telephones and their base stations, walkie-talkies, etc. can affect the Maxi Sky 2 and should be kept at least 2.3 m away from it. Cables from potentially strong sources of electromagnetic fields should not be placed near the unit.

Battery type	12 V, 5 Ah, sealed rechargeable valve regulated lead acid battery
Battery capacity	Provides up to 120 transfers with a load of 100 kg (220 lb), up to 70 transfers with a load of 200 kg (440 lb)
Degree of protection - Hand control	IPX7
Degree of protection - Maxi Sky 2	IP24
Lift - protection class - shock prevention	Internally powered equipment
Battery Charger input	100-240 VAC, 50-60 Hz, 57 - 70 VA.
Battery Charger output	28.1 VDC, 1 A max, 28.1 VA
Battery Charger safety protection	Class 2, double insulated

OPERATION, TRANSPORT AND STORAGE CONDITIONS

Normal Operation	Ambient temperature range: 10°C to 30°C (50°F to 86°F) Relative humidity range: 10% to 70% Atmospheric pressure range: 700 hPa to 1060 hPa
Storage	Ambient temperature range: -40°C to 70°C (14°F to 158°F) Relative humidity range: 10% to 70% Atmospheric pressure range: 500 hPa to 1060 hPa

WARNING: This equipment is not suitable in the presence of flammable anesthetic mixtures with air or oxygen, or with nitrous oxide.

MAXI SKY2 PLUS

GENERAL

Weight, complete (incl. trolley and two ceiling lifts)	51.6 kg (113.5 lb)
Weight, spreader bar	6.6 kg (14.5 lb)
Lifting capacity	Dual Mode 454 kg (1000 lb), Single Mode 272 kg (600 lb)
Strap length	2500 mm (98.4 in)
Lifting speed (Dual Mode)	4.3 cm/s (1.7 in/s) without load 3.4 cm/s (1.3 in/s) at 240 kg (528 lb) 3.0 cm/s (1.2 in/s) at 400 kg (880 lb) 2.9 cm/s (1.1 in/s) at 454 kg (1000 lb)
Maximum stroke (from ceiling)	2300 mm (90.6 in)
Horizontal displacement speeds	N/A, Manually operated
Operating force of control	< 5 N
Push and pull forces at 454 kg (1000 lb)	< 60 N
Horizontal Movement and Rotation	
Duty cycle	Up/Down Motor: Max 10%, 1 minute continuously Sit/Reclined Motor (Single Mode): Max 10%, 1 minute continuously
Horizontal displacement speeds	N/A
Vertical axis motor	24 VDC, 110 watts
Rating	24 VDC, 15 A max
Noise level for either raising or lowering, with or without load	58.2 dBA with no load, 65.3 dBA at 454 kg (1000 lb)
Medical equipment	Type BF protection against electrical shock in accordance with IEC 60601-1

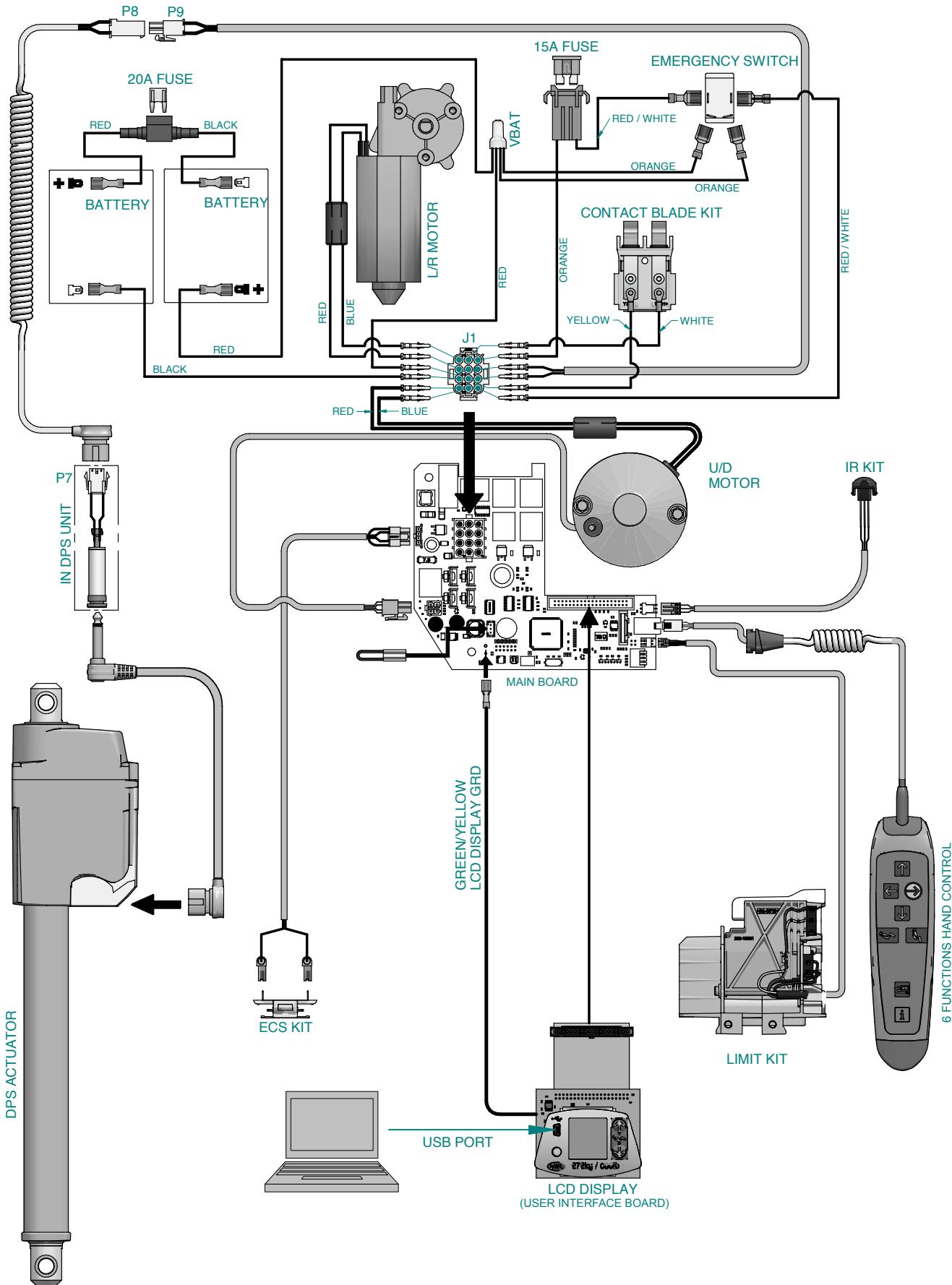
WARNING: Wireless communications equipment such as wireless home network devices, mobile phones, cordless telephones and their base stations, walkie-talkies, etc. can affect the *Maxi Sky 2 Plus* and should be kept at least 2.3 m away from it. Cables from potentially strong sources of electromagnetic fields should not be placed near the unit.

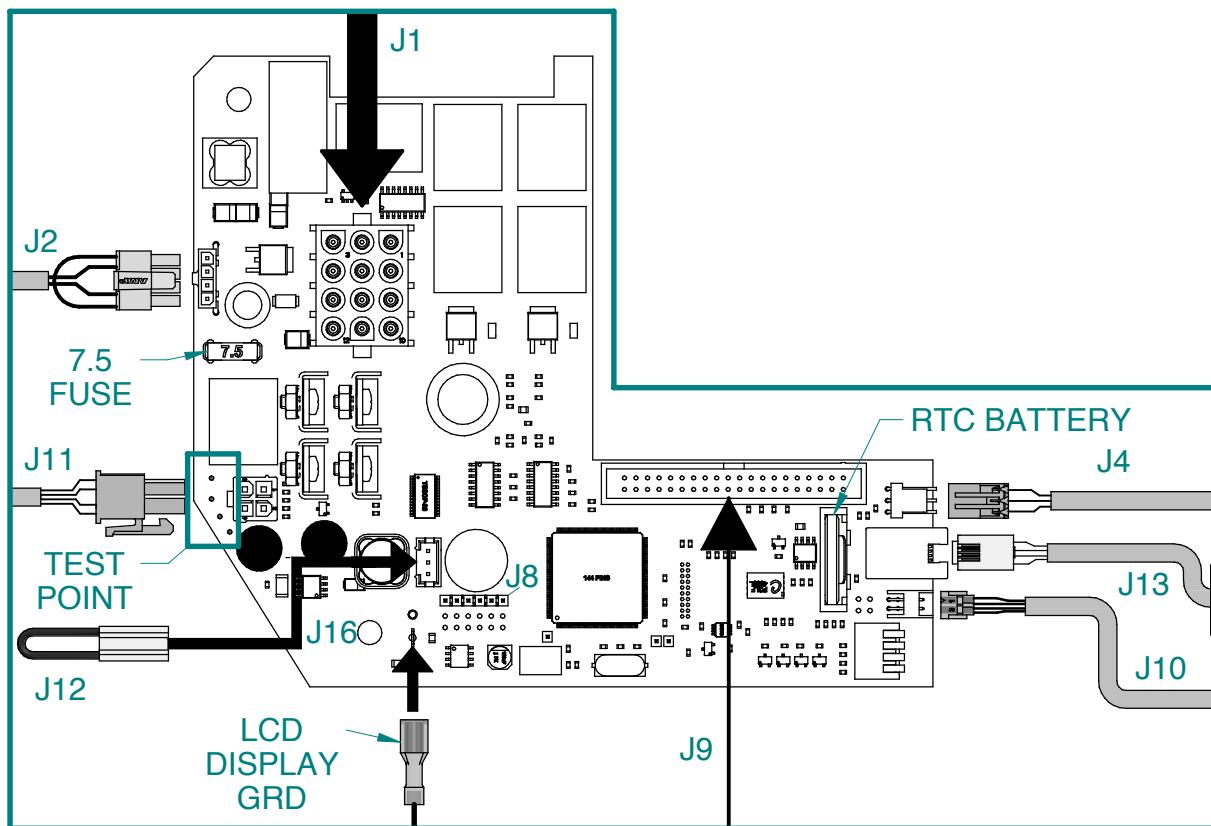
Battery type	12 V, 5 Ah, sealed rechargeable valve regulated lead acid battery
Battery capacity	Provides up to 110 transfers with a load of 200 kg (440 lb), up to 50 transfers with a load of 400 kg (880 lb) and up to 34 transfers with a load of 454 kg (1000 lb)
Degree of protection - hand control	IPX7
Degree of protection - Maxi Sky 2 Plus	IP24
Ceiling lift - protection class - shock prevention	Internally powered equipment
Battery charger input	100-240 VAC, 50-60 Hz, 57 – 70 VA
Battery charger output	28.1 VDC, 1 A max, 28.1 VA
Battery Charger safety protection	Class 2, double insulated

Normal Operation	Ambient temperature range: 5°C to 40°C (41°F to 104°F) Relative humidity range: 15% to 93% Atmospheric pressure range: 700 hPa to 1060 hPa
Transport / Storage	Ambient temperature range: -40°C to 70°C (-40°F to 158°F) Relative humidity range: 10% to 93% non-condensing Atmospheric pressure range: 500 hPa to 1060 hPa

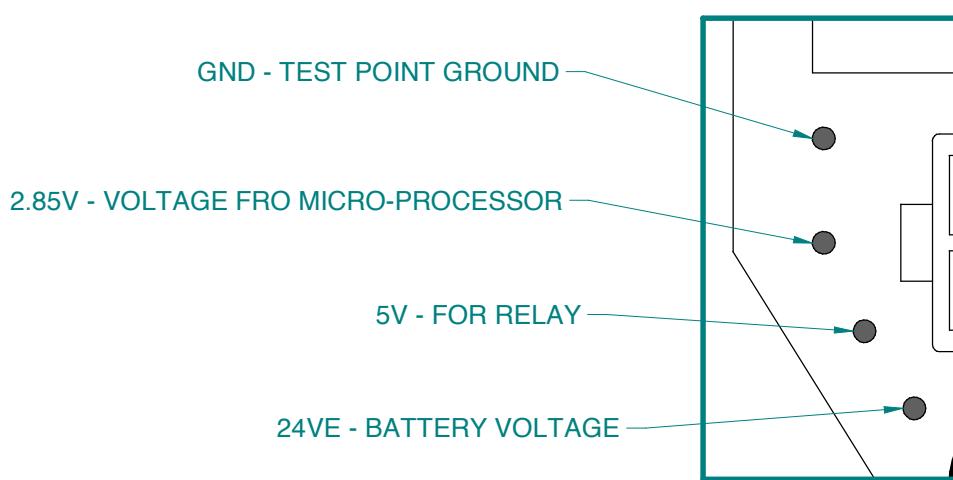
WARNING: This equipment is not suitable in the presence of flammable anesthetic mixtures with air or oxygen, or with nitrous oxide.

MAXI SKY 2 WIRING DIAGRAM

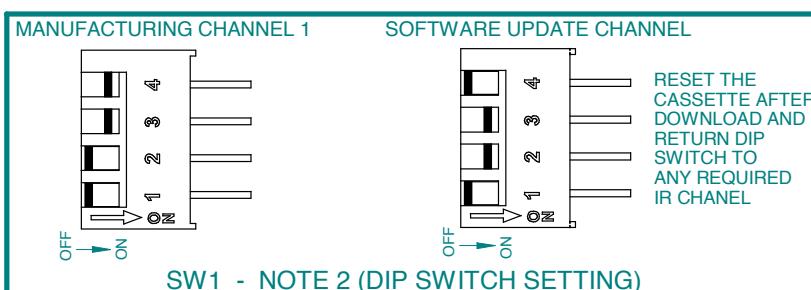
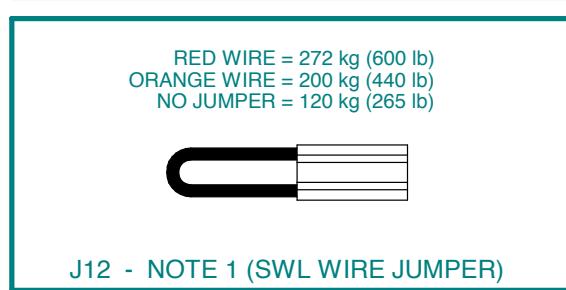
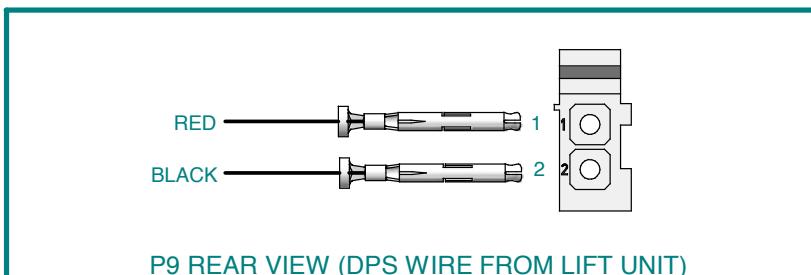
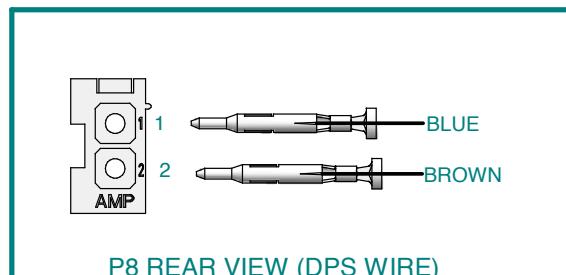
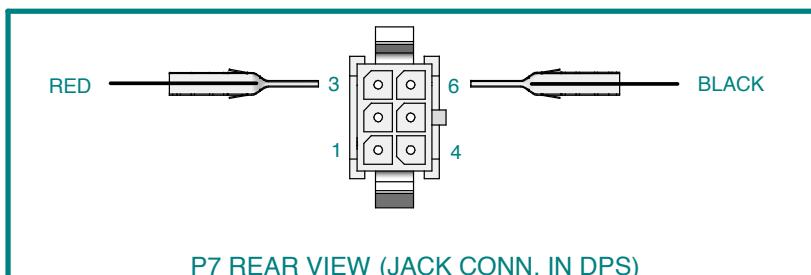
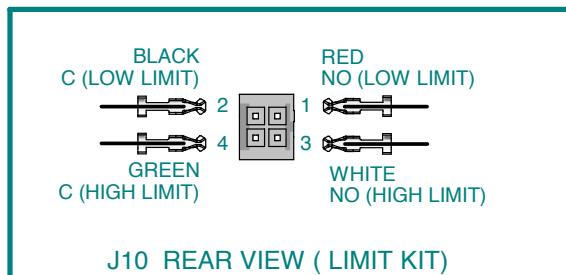
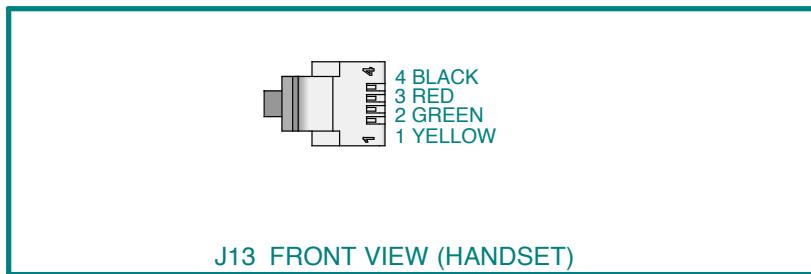
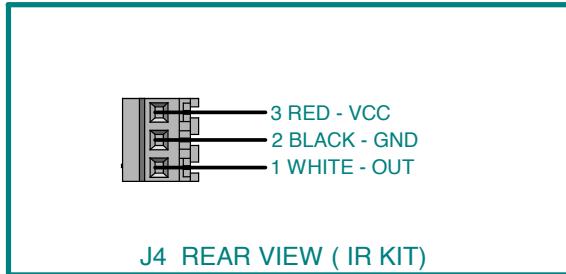
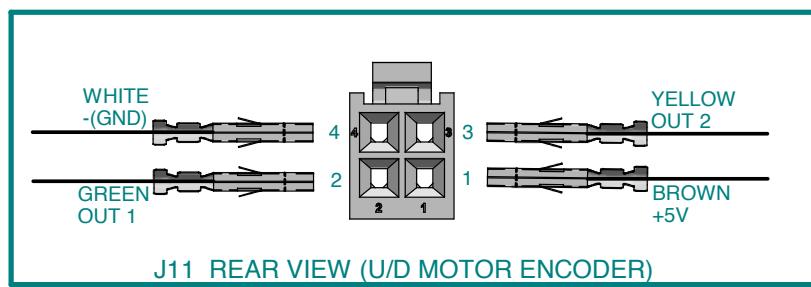
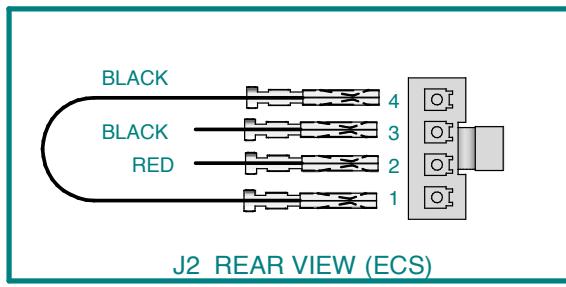
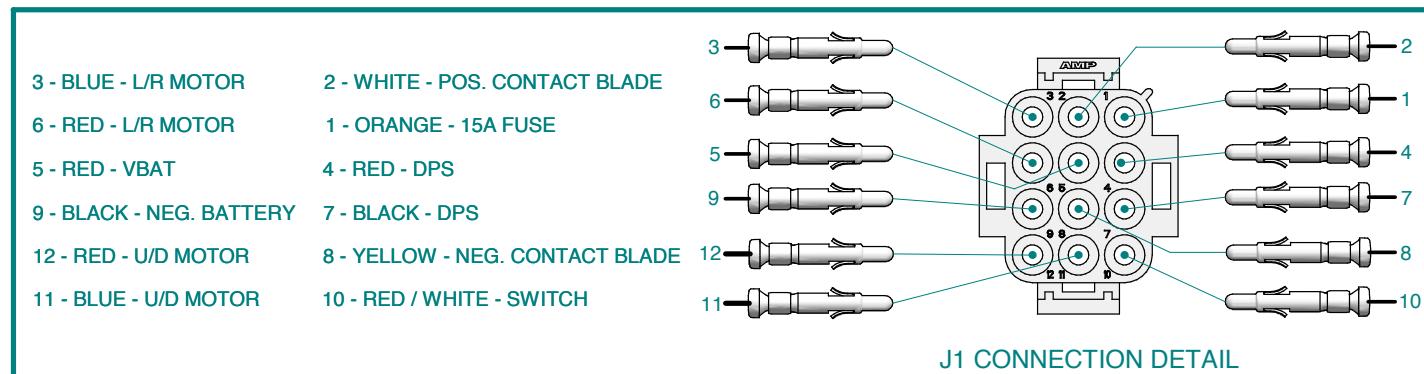




TEST POINTS



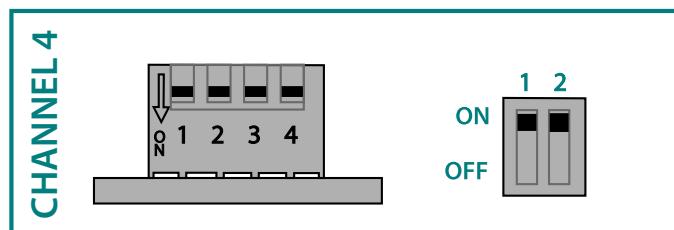
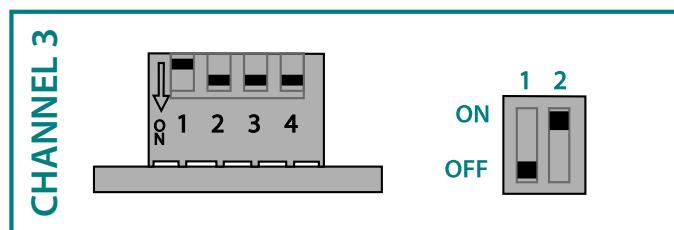
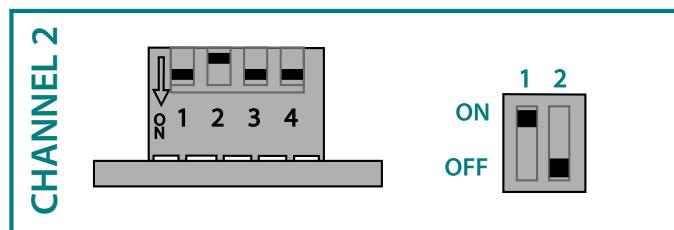
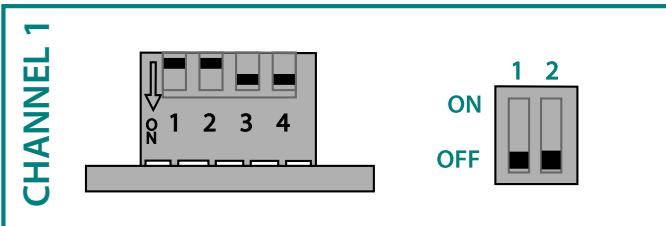
CONNECTION DETAILS





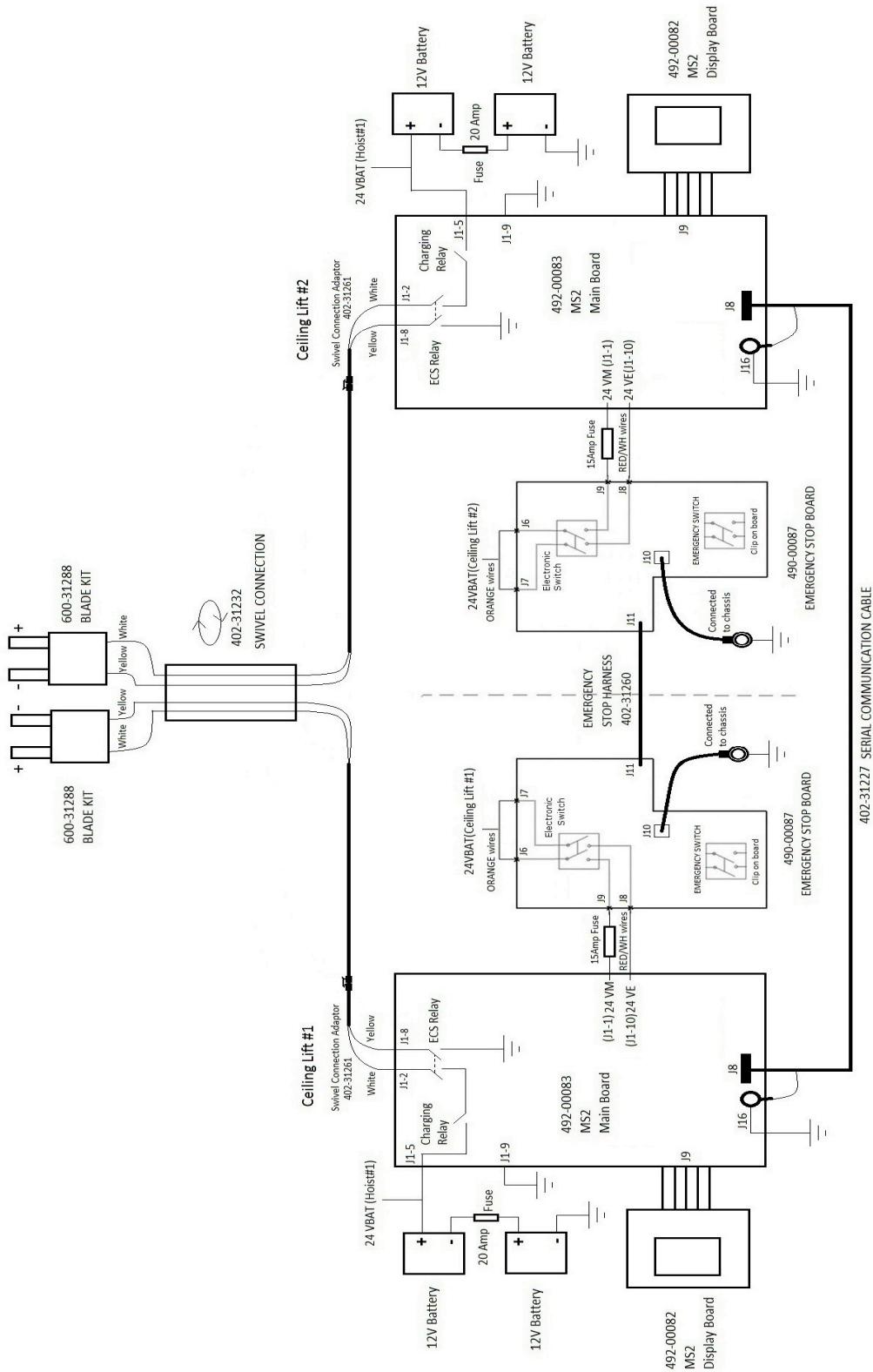
MS2 CASSETTE
DIP SWITCH
SW1 ON PCB

IR HAND CONTROL
DIP SWITCH
SW1 ON PCB

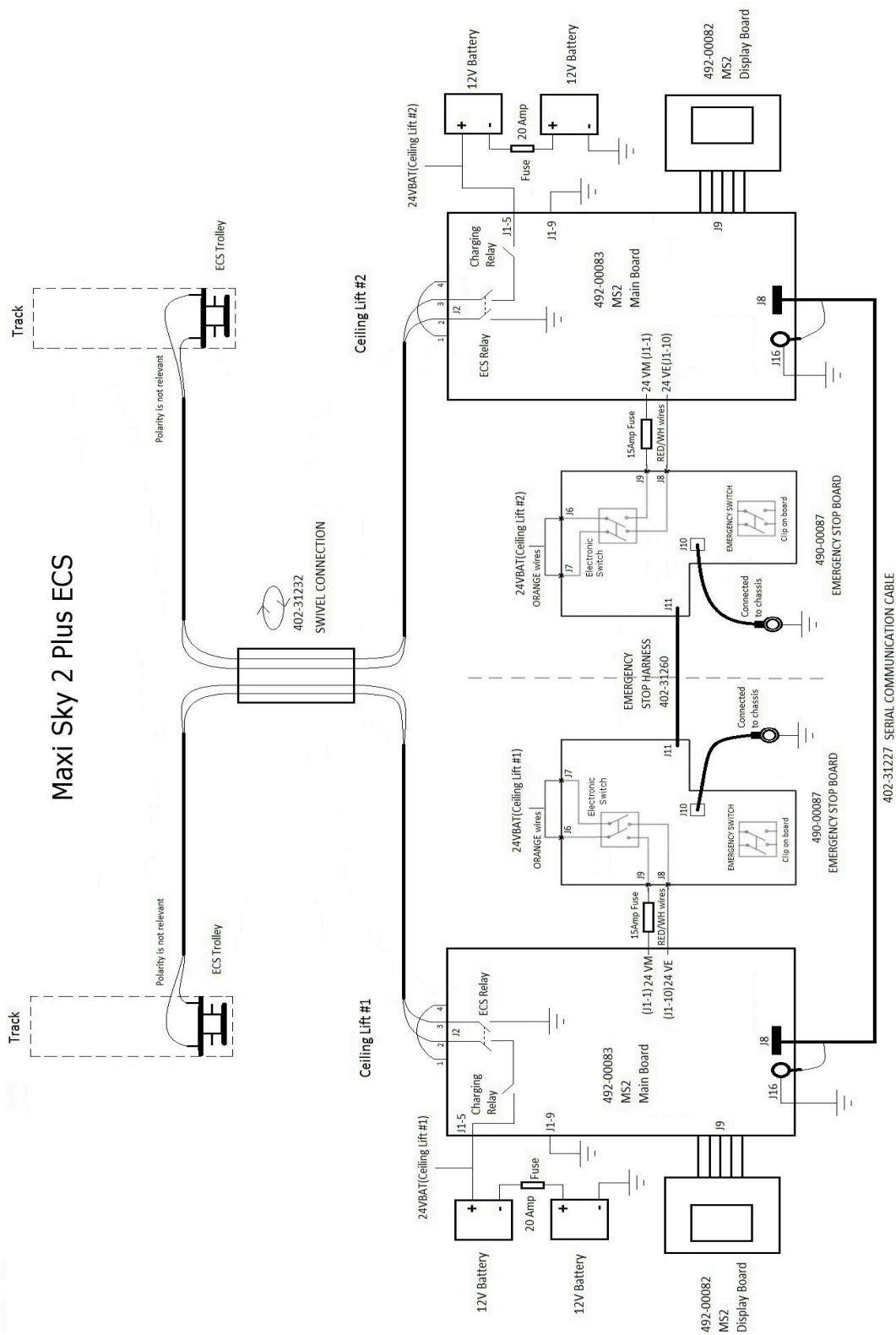


MAXI SKY 2 PLUS (C-STAT) WIRING DIAGRAM

Maxi Sky 2 Plus C-Stat



MAXI SKY 2 PLUS (ECS) WIRING DIAGRAM



MAINTENANCE & MALFUNCTION CODES 8

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RESET MAINTENANCE CODE	15
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TROUBLESHOOTING	19

HOW TO USE THIS SECTION

The *Maxi Sky 2* is equipped with a self-diagnosis system which displays either malfunction or maintenance code.

The malfunction code  appears instantly when a problem occurs with the lift. After resetting the lift or when coming out from sleep mode, the malfunction will be converted into a maintenance code . Refer to "Malfunction codes table" for the malfunction codes list.

The maintenance code can be called in two different ways:

Malfunction code as mentioned above

Cycles or days (Preventive maintenance)

For MS2 Plus, each ceiling lift (leading or driven) will call independently its malfunction or maintenance codes.

For the maintenance codes list and the procedure, refer to the section "HOW TO PERFORM MAINTENANCE".

After completion of a maintenance, refer to the section "RESET THE MAINTENANCE CODE".

If there is no malfunction nor maintenance code, refer to section "TROUBLESHOOTING".

HOW TO PERFORM MAINTENANCE

NOTE

AFTER COMPLETING MAINTENANCE , RESET THE MAINTENANCE CODE;
REFER TO "RESET MAINTENANCE CODE", PAGE 8-15

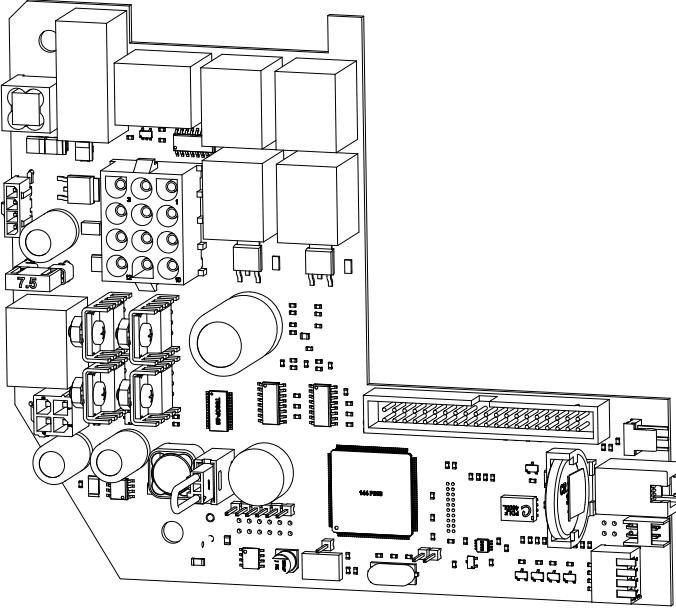
NOTE

UNLESS OTHERWISE SPECIFIED THE FOLLOWING MAINTENANCE AND INSPECTION INSTRUCTIONS ARE APPLICABLE FOR BOTH MS2 AND MS2 PLUS.

MAINTENANCE CODE TABLE

PM Code	Maintenance Description	Trigger	Default Value
A	Replace the strap	Cycles	5000
B*	Replace the 12V batteries	Cycles	32000
C	Replace real time clock lithium battery on the main board	Days	1825
D	Annual inspection of the lift	Days	365
E	Annual inspection of spreader bar	Days	365
F	Annual inspection of the rail installation	Days	365
G	Check KWIKtrak accessory	Malfunction #19 Rail accessory overcurrent	-
H	Check upper limit switch	Malfunction #2 High limit switch fault	-
I	Main board or user interface board have a memory problem	Malfunction #0: Memory fault	-
J	Replace main board	Malfunction #6 Brake relay fault Malfunction #12 Main board oscillator fault Malfunction #13 Unexpected current on Up/Down motor Malfunction #14 Unexpected current on Left/Right motor Malfunction #15 Unexpected current on Sit/Reclined motor Malfunction #17 Accessories or charging defect Malfunction #20 ECS relay fault	-
L	Encoder Problem	Malfunction #1 Up/Down motor encoder fault	-
M	Problem with Up/Down motor	Malfunction #3 Up/Down motor drive fault Malfunction #4 Holding system not functional Malfunction #5 Motor Up/Down wiring fault Malfunction #7 Overcurrent on Up action Malfunction #8 Overcurrent on Down action	-
N	Problem with Left/Right motor	Malfunction #9 Overcurrent on Left/Right action	-
O	Problem with Sit/Reclined motor	Malfunction #10 Overcurrent on Sit/Reclined action	-

* : B PM code is displayed on 2.0 and 2.1 only.

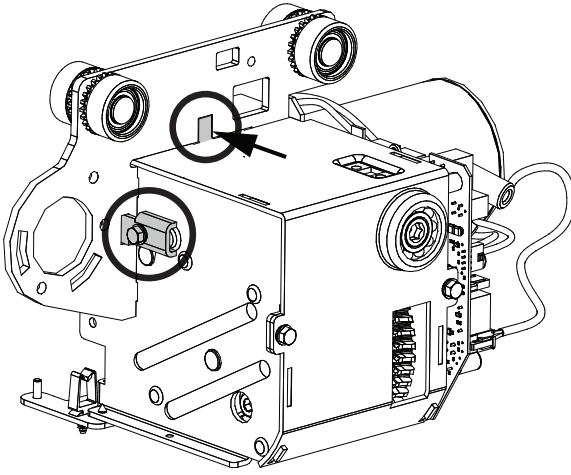
PM code	Description	What to do/What to check
PM code A-B-C		
A	1. Replace the strap	Refer to section "STRAP CHANGE", page 6-13.
B	1. Replace the 12V batteries	Refer to section "REMOVING THE BATTERIES", page 6-17 and "INSTALLING THE BATTERIES", page 6-18.
C	1. Replace real time clock lithium battery	<p>Replace the lithium battery CR2032 3V (403.02032) on the main board (positive polarity should be oriented on the same side of the hand control connector).</p> 

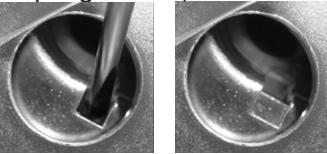
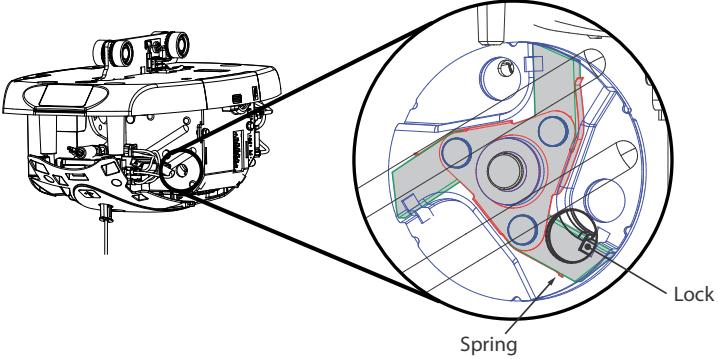
PM code D: Annual inspection of the lift

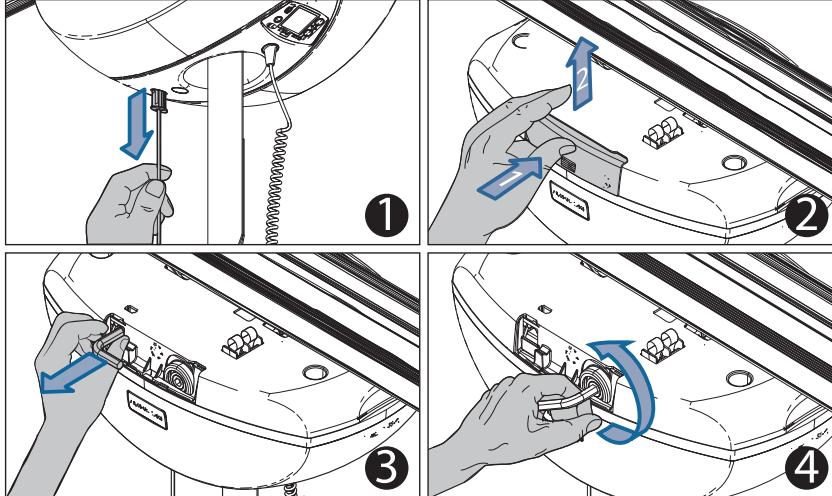
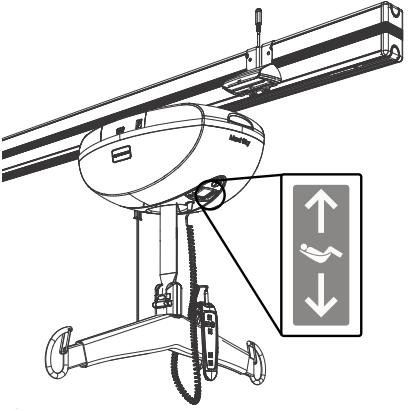
Charging system	
	<ol style="list-style-type: none"> 1. Bring the lift under a charging station. 2. Wait 15 seconds, the display will cycle through charge level icons according to actual battery charge level to show the charging progress. 3. The LED will blink green until batteries are fully charge. 4. Inspect and change the contact blades if any where cracks are visible. For MS2 refer to "Removing the Contact Blade Kit" section 6-31 and "Installing the Contact Blades Kit" section 6-32. For MS2 Plus, change both sets of contact blades, refer to "Replacement of MS2 Plus Contact Blades" section 6-65.
D	<p>Charging station</p> <p>For MS2 Plus only, inspect the charging station protective white sticker to detect wear exposing the metalic casing of the contact station. If any are detected replace the contact station.</p>
NOTE	
THE GREEN LED MAY BE DISABLED. IN THIS CASE, IT WILL NOT BLINK	
NOTE	
IF THE BATTERIES HAVE BEEN COMPLETELY DRAINED IT COULD TAKE UP TO 8 HOURS TO COMPLETELY RECHARGE THEM.	

	ECS System	<p>1. Wait 15 seconds after the last activation of the lift, ECS symbol should appear on the screen only if batteries are lower than 80%. Otherwise it may take up to three hours before the ECS symbol appears.</p> <p>NOTE</p> <p>THE GREEN LED MAY BE DISABLE. IN THIS CASE, IT WILL NOT BLINK</p> <p>NOTE</p> <p>IF THE BATTERIES HAVE BEEN COMPLETELY DRAINED IT COULD TAKE UP TO 8 HOURS TO COMPLETELY RECHARGE THEM.</p>
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PM code	Description	What to do/What to check
Emergency stop system		
D	Verify functionality of the Emergency Stop system	<p>1. Pull on the Red Cord to shut the power off.</p> <p>2. Ensure that no other action can be made. The display and the LED shall be turned off.</p> <p>3. Inspect general condition of the Red Cord.</p> <p>For MS2 Plus only:</p> <p>4. Pull the red emergency cord on the leading ceiling lift, both ceiling lifts will shut down.</p> <p>5. Push it back upward, both ceiling lifts turn back on and are now functional.</p> <p>6. Pull the red emergency cord on the driven ceiling lift, both ceiling lifts will shut down.</p> <p>7. Push it back upward, both ceiling lifts turn back on and are now functional.</p>

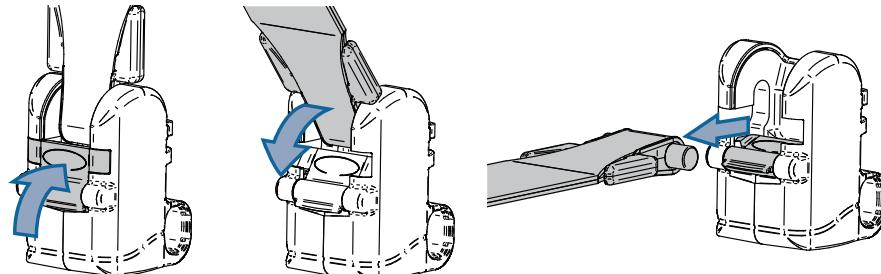
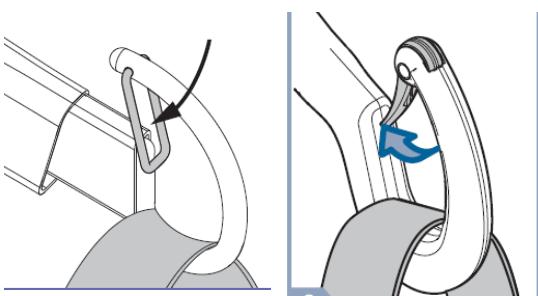
Frame Interlock		
	Verify the presence of the interlock tab on the frame assembly	
	Verify trolley locker on the frame	

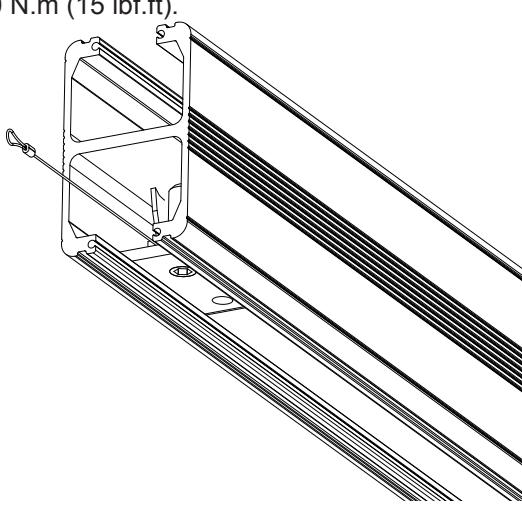
Emergency Brake	
D	<p>Verify functionality of the emergency brake</p> <p>1. Remove bottom cover. 2. Rotate drum (using Up/Down button on hand control) and align the emergency brake latch with the frame hole. 3. Push on the latch, using a flat screwdriver or the like, and it should return to its initial position (latches are spring loaded).</p> <div style="text-align: center;">  </div> <p>4. Rotate the drum again (using hand control) and align the next emergency brake latch with the frame hole. There are three different latches to test.</p> <div style="text-align: center;"> <p>Emergency brake view through frame</p>  </div>

PM code	Description	What to do/What to check
	Emergency Lowering Device	<p>Verify functionality of the emergency lowering device</p> <p>NOTE THE EMERGENCY LOWERING DEVICE CAN BE VERIFIED WITH OR WITHOUT ATTACHING A LOAD.</p> <ol style="list-style-type: none"> 1. Pull the red emergency cord to turn off power. 2. Open the small side door to access the lowering mechanism. 3. Remove the 8 mm hex key on the top of the ceiling lift. Insert the hex key deep into the socket. 4. Turn the hex key counter-clockwise to slowly lower the spreader bar.  <p>WARNING DO NOT USE THE UP/DOWN FUNCTIONS WHEN THE HEX KEY IS INSERTED INTO THE SOCKET AS IS CAN LEAD TO INJURIES.</p>
D	Auxiliary Up/Down Button	<p>Verify functionality of the alternate Up/Down buttons</p> <ol style="list-style-type: none"> 1. Press and hold each button (Up and Down).  <p>NOTE WITH THE DOWN FUNCTION, ALWAYS KEEP TENSION (AT LEAST THE WEIGHT OF THE 2 HOOKS SPREADER BAR) ON THE STRAP. THIS WILL PREVENT THE DOWN FUNCTION FROM STOPPING.</p>

PM code	Description	What to do/What to check
	Limit switch	<p>1. Press and hold the Up button until the lift stops at the top of its stroke. 2. Press and hold the Down button until the stops at the end of its stroke of the lift (lower limit).</p> <div style="background-color: black; color: white; padding: 5px; text-align: center;"> NOTE </div> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>WITH THE DOWN FUNCTION, ALWAYS KEEP TENSION (AT LEAST THE WEIGHT OF THE 2 HOOKS SPREADER BAR) ON THE STRAP. THIS WILL PREVENT THE DOWN FUNCTION FROM STOPPING.</p> </div>
	Verify functionality	<p>For MS2 Plus only Set the product in dual then perform step 1 and 2 during which both sides of the spreader bar (leg end and foot end) should raise at the same speed.</p> <p>3. Remove tension on the leading ceiling lift strap and press the DOWN button: down motion stops for both straps. 4. Remove tension on the driven ceiling lift strap and press DOWN button: down motion stops for both straps.</p>
D	Sit / Recline (For MS2 Plus Only)	
	Verify functionality	<p>1. Press and hold RECLINE button: The end of the spreader bar, with the feet logo, moves up. If it doesn't spreader bar installation is inverted. 2. Press and hold SIT button: The end of the spreader bar, with the feet logo, moves down. If it doesn't spreader bar installation is inverted. 3. Ensure that the stroke of the spreader bar end, with feet logo, (which is limited by software) is symmetrical in regards to the spreader bar end with head logo and is in the range of 350 mm (+/-25).</p> <p>Vibration noise from spreader may occur during test.</p>
	Trolley and Left/Right transmission	<p>1. Check trolley and wheels for damage, rust or cracks. 2. Wheels shall rotate freely.</p> <p>For MS2 4 functions only:</p> <ul style="list-style-type: none"> • Press and hold the left/right button and pay attention for any abnormal noise along the rail path. <p>For MS2 Plus only:</p> <p>3. Ensure system rotates 360° in both directions without restriction. 4. Ensure both MS2 ceiling lifts: - are secured to the trolley with lock and bolt. - can swivel freely.</p>

Up/Down transmission	
Inspect and grease transmission	<ol style="list-style-type: none"> 1. Check gear for excessive wear. 2. Using Lubriplate grease (P/N: P8180), make sure the second stage gear has enough grease. 3. Remove excessive grease on the side of the gear to avoid getting any on the strap.
Plastic covers	
Verify general condition of the plastic covers	<ol style="list-style-type: none"> 1. Check for cracks on the plastic parts. <ol style="list-style-type: none"> a. Strap Inlet b. Bottom cover c. Top Cover 2. Verify the presence of the tool door and the battery door.
Weight load test	
Perform a Load Test at SWL on Lift and Track	<p>Refer to section "Performing a Weight Load Test", page 6-69, and sub-section "Load Test at SWL on Lift and Track".</p> <ol style="list-style-type: none"> 1. Make sure the adjusted SWL setting of the lift (at startup on the display and on the sticker) is equal to or lower than the SWL of the installation. 2. Perform one lift with the SWL. <div style="background-color: black; color: white; text-align: center; padding: 5px;">NOTE</div> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>IF THE LIFT CANNOT RAISE THE WEIGHT; REFER TO SECTION "ADJUSTMENT OF THE CURRENT LIMITER", PAGE 5-4, TO INCREASE THE OVERWEIGHT LIMIT</p> </div>

PM code	Description	What to do/What to check
PM code E: Annual inspection of the spreader bar		
	Quick Connect	<p>1. Open the latch that locks the strap in place by pushing it inward. 2. Rotate the strap towards the latch. 3. Pull the strap out of the attachment.</p> <p>Pay attention to:</p> <ul style="list-style-type: none"> • Missing parts • General condition <p>Verify general assembly and functionality of the Safe Connect</p> 
E	Spreader Bar	<p>1. Verify general condition of the spreader bar for damage or cracks. 2. Verify presence and functionality of each latch.</p> <p>Loop Spreader Bar Verify functionality of the latch</p> 
MS2 Plus Spreader Bar		
E	Verify general condition	<p>1. Ensure that the green strap aligns with the green dots on the spreader bar and quick connect cover. 2. Ensure that all labels are readable. 3. Ensure that the link between the spreader bar can extend and retract freely. 4. Vibration noise may be heard during test operation.</p>

PM code	Description	What to do/What to check
E	Manual DPS (flat & open)  Verify functionality of the Friction disk	1. Verify general condition of the DPS for damage or crack. 2. Rotate the bottom frame using the handle. 3. Make sure the frame keeps its position.
	Powered DPS  Verify functionality of the actuator	1. Verify general condition of the spreader bar for damage or cracks. 2. Press and hold the ⌂ and ⌂ on the hand control. 3. Pay attention to abnormal noise.
PM code F: Annual inspection of the rail installation		
F	Annual inspection of the installation Verify presence of End Stopper	1. End stopper shall be present at each extremity of the rail path and they shall be torque to 20 N.m (15 lbf.ft). 

PM code	Description	What to do/What to check
F	General condition of the rail	<ol style="list-style-type: none"> 1. Verify the general condition of the ceiling (damage, cracks) 2. Make sure the rail is level when it is not loaded. 3. Make sure that attachments (ceiling brackets, wall posts, wall brackets, rail brackets) have not been displaced, damaged or removed. 4. Make sure rail joints are closed and that the spring pins are centered. 5. Check that the accessories (X-Y system, Gate, Exchanger, Turntable, Charging station and PPP station) are complete and correctly maintained.
	(Optional) Perform a load test on track with deflection measurement when under load	<ol style="list-style-type: none"> 1. Refer to section "Performing a Weight Load Test" (6-69), sub-section - Load Test on Track with Deflection Measurement when Under Load. 2. Select the load at which the test shall be done: 100%, 125% or 150% of SWL. 3. Refer to weight load test form 001-11760-EN for acceptance criteria.

PM code G-H-I-J-L-M-N-O

G	KWIKtrak accessory has a short circuit problem.	<ol style="list-style-type: none"> 1. Reset the preventive maintenance. 2. Try to find which accessory is at fault. <ol style="list-style-type: none"> a. The rail accessory is not working. b. The preventive maintenance is displayed when the MS-2 is moved under the defective accessory.
H	<p>The high limit circuit still open after a downward traveling of at least two inches.</p> <p>Associated to Malfunction 2: High limit switch fault</p>	<ol style="list-style-type: none"> 1. Check if the connector J10 (high limit) is connected to the main board. 2. Check that the wires and the terminals at the connector J10 are in good condition. 3. Check the electric contact of the limit switches : <ol style="list-style-type: none"> a. Disconnect the connector J10 from the main board. b. Check the conductivity between the white and the green wire. (The continuity status is short circuit when the strap end is out of the strap inlet, and is open circuit when the strap end is in the strap inlet.) c. Check the continuity between the red and the black wires. (The conductivity status is short circuit when there is no tension on the strap, and is open circuit when there is tension on the strap.) 4. Without any weight, press the Up button until the strap reaches the high limit switch. If the high limit is not detected, inspect the limit kit. 5. Without any weight, press the Down button until the no tension limit stops the action. If the down action is not stopped after 2 sec., inspect the limit kit. 6. Replace the limit kit if necessary (refer to section "REMOVING THE LIMIT KIT", page 6-44 and "INSTALLING THE LIMIT KIT", page 6-46, for procedure).

PM code	Description	What to do/What to check
I	<p>Statistics are no longer updated. (Total lifts, lifts last day, lifts last week, average lifts/day)</p> <p>Associated to Malfunction 0: Memory fault</p>	<ol style="list-style-type: none"> 1. Replace the main board; refer to section "REMOVING THE MAIN BOARD", page 6-33 and "INSTALLING THE MAIN BOARD", page 6-35. 2. If the problem is not fixed, reinstall the original main board and replace the user interface board. (refer to section "REMOVING THE USER INTERFACE BOARD", page 6-37 and "INSTALLING THE USER INTERFACE BOARD", page 6-39 for procedure). 3. Return the defect board to ArjoHuntleigh for inspection, accompanying with a short description of the problem. <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>NOTE</p> <p>NEVER CHANGE THE MAIN BOARD AND THE USER INTERFACE BOARD SIMULTANEOUSLY. THE LIFT MAY NOT BE USABLE (E.G. DISPLAY IS BLACK, RED LED AND LIFT REMAINS IN STARTING MODE).</p> </div>
J	<p>Replace main board.</p> <p>Associated to:</p> <p>Malfunction 6: Brake relay fault (The brake relay doesn't short the Up/Down motor. When the emergency stop is pulled, the capacity of maintaining a patient is compromised, patient can go down slowly or fast)</p> <p>Malfunction 12: Main board oscillator fault (All functions activation such as Up, Down, Left, Right starts slowly and progresses slowly too).</p> <p>Malfunction 13: Unexpected current on Up/ Down motor (driver or MOSFET's problem).</p> <p>Malfunction 14: Unexpected current on Left/ Right motor (MOSFET is short)</p> <p>Malfunction 15: Unexpected current on Sit/ Reclined motor (MOSFET is short)</p> <p>Malfunction 17: Accessories or charging defect (The MOSFET that power the accessory is short or the charging relay stays ON)</p> <p>Malfunction 20: ECS relay fault (The ECS relay stays ON)</p>	<ol style="list-style-type: none"> 1. Replace the main board and return the defective board to ArjoHuntleigh for inspection with a short description of the problem. (refer to section "REMOVING THE MAIN BOARD", page 6-33 and "INSTALLING THE MAIN BOARD", page 6-35 for procedure). 2. When problem is solved, reset the preventive maintenance.

PM code	Description	What to do/What to check
L	<p>Up/Down motor does not rotate or the encoder does not read the motor speed.</p> <p>Associated to Malfunction 1: Up/Down motor encoder fault</p>	<ol style="list-style-type: none"> 1. Check if the encoder J11 is connected. 2. Check if the encoder wire and the contact are correct at J11. 3. Press Up or Down and check if the strap moves and if a malfunction is displayed. 4. Connect an external Up/Down motor (don't forget to connect the encoder) and test if the Up and the Down action work. If it works with the external motor, replace the motor; refer to "REMOVING THE UP/DOWN MOTOR", page 6-52 and "INSTALLING THE UP/DOWN MOTOR", page 6-54.
M	<p>Up/Down Motor is not functional.</p> <p>Associated to:</p> <p>Malfunction 3: Up/Down motor drive fault (Malfunction from the motor driver caused by a short circuit of the motor or the driver is not powered)</p> <p>Malfunction 4: Holding system not functional (wiring of the motor is broken)</p> <p>Malfunction 5: Motor Up/Down wiring fault (The wiring path of the Up/Down motor is opened)</p> <p>Malfunction 7: Overcurrent on Up action</p> <p>Malfunction 8: Overcurrent on Down action</p>	<ol style="list-style-type: none"> 1. If malfunction 8 is displayed, verify that the Up/Down action are not inverted. If so, check limit kit (lower limit). If not, continue the following troubleshooting. 2. Try to reproduce the malfunction with the Up/Down motor. 3. Check if the 15A motor fuse is blown up (near the emergency stop). Replace it and test again. 4. Power off the MS-2. Disconnect the power connector J1. Check the conductivity of the Up/Down motor (Blue wire pin 11 and Red wire pin 12). If the Up/Down motor is short (lower than 2 ohms) or open, replace it and test again. 5. Connect an external Up/Down motor (don't forget to connect the encoder) and test if the Up and the Down action work. If it works with the external motor, replace the motor; refer to section "REMOVING THE UP/DOWN MOTOR", page 6-52 and "INSTALLING THE UP/DOWN MOTOR", page 6-54. 6. If the malfunction appears again, replace the main board; refer to section "REMOVING THE MAIN BOARD", page 6-33 and "INSTALLING THE MAIN BOARD", page 6-35. 7. When problem is solved, reset the preventive maintenance. <div style="text-align: center; border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>NOTE</p> <p>WHEN THE UP/DOWN MOTOR IS REPLACED, DON'T FORGET TO INSTALL THE MOTOR MAGNET IN THE SAME POSITION. A 180 DEGREES TURN OF THE MAGNET WILL CAUSE THE MOTOR TO TURN IN THE WRONG WAY</p> </div>
N	<p>Left/Right Motor is not functional.</p> <p>Associated to Malfunction 9: Overcurrent on Left/Right action</p>	<ol style="list-style-type: none"> 1. Try to reproduce the malfunction with the Left/Right motor. 2. Check if the 15A motor fuse is blown (near the emergency stop). Replace it and test again. 3. Power off the MS-2. Disconnect the power connector J1. Check the conductivity of the Left/Right motor (Blue wire pin 3 and the Red wire pin 6). If the Left/Right motor is short (lower than 2 ohms), replace it and test again; refer to section "REMOVING THE LEFT/RIGHT MOTOR", page 6-41 and "INSTALLING THE LEFT/RIGHT MOTOR", page 6-42. 4. Connect an external Left/Right motor and test if the Left and the Right actions work. If the external motor works, replace the motor. 5. If the malfunction appears again, replace the main board; refer to section "REMOVING THE MAIN BOARD", page 6-33 and "INSTALLING THE MAIN BOARD", page 6-35. 6. When problem is solved, reset the preventive maintenance.
O	<p>Sit/Reclined Motor is not functional.</p> <p>Associated to Malfunction 10: Overcurrent on Sit/Reclined action</p>	<ol style="list-style-type: none"> 1. Try to reproduce the malfunction with the Sit/Reclined motor. 2. Check if the 15A motor fuse is blown (near the emergency stop). Replace it and test again. 3. Power off the MS-2. Disconnect the power connector J1. Check the conductivity of the Sit/Reclined motor (Black wire pin 4 and the Red wire pin 7). If the Sit/Reclined motor is short, replace it and test again. 4. Connect another PDPS and test if the Sit/Reclined actions work. If it's not working, replace the PDPS. 5. If the malfunction appears again, replace the main board. 6. When problem is solved, reset the preventive maintenance.

RESET MAINTENANCE CODE

The maintenance code  is displayed when the system is waking up from sleep mode or when the unit is turned on. The icon, accompanied with the red LED, shows up for 7 seconds then blinks every 5 seconds.

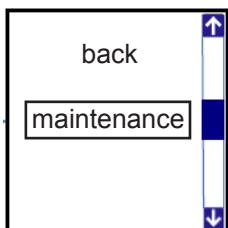


Once you have done a required maintenance, you need to erase its corresponding code to indicate it has been completed.

-Shut OFF the Power by pulling on the red emergency stop cord.

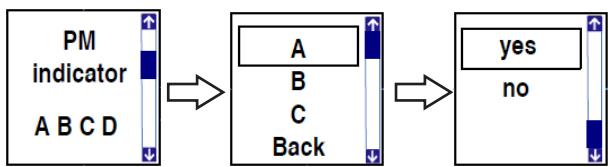


-Turn the lift ON by pushing on the red button.
-When the loading display appears on the screen, press  +  +  on the hand control.



-Press  button to select "maintenance" menu
-Confirm your selection by pressing on the  button

For software version 2.0 and 2.1



-Press  button to select PM indicator.
-Confirm your selection by pressing on the  button.
-Select maintenance letter that has been performed by pressing the  button.
-Select "yes" and press  button, then the letter associated to this maintenance will disappear from the list.

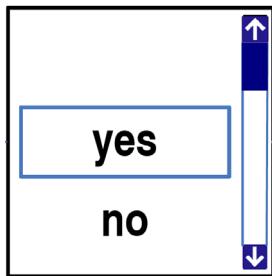
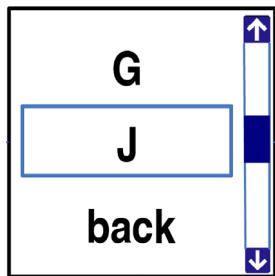
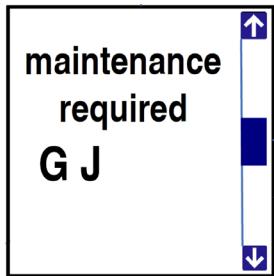
According to the preventive maintenance table on the next page, the maintenance will appear with the specified frequency.

For software version 2.2.X and up

There are 2 ways to reset a maintenance code

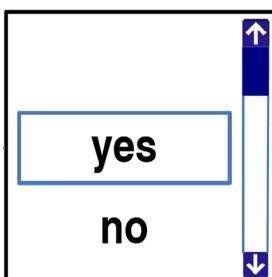
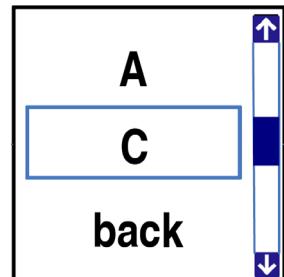
1. When maintenance has been performed, follow the steps described on page 8-15 to access the maintenance menu.

- Press  button to select “maintenance required”.
- Confirm your selection by pressing on the  button.
- Select a maintenance letter that has been performed by pressing on the  button.
- Select “yes” and press  button, then the letter associated to this maintenance will disappear from the list.
- Repeat the same sequence for each maintenance action performed.



2. To reset the letter of a maintenance performed before it is due and pops up on the screen, follow the steps described on page 8-15 to access the maintenance menu.

- Press  button to select “preventive maintenance scheduled”.
- Confirm your selection by pressing on the  button
- Select a maintenance letter to be reset by pressing on the  button
- Select “yes” and press  button, then the letter associated to this maintenance will disappear from the list.



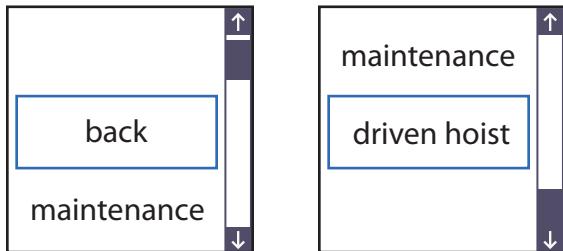
For MS2 Plus

To reset the maintenance code on the leading ceiling lift, follow the instruction on the previous page.

To reset the maintenance code on the driven ceiling lift, follow the instructions below.

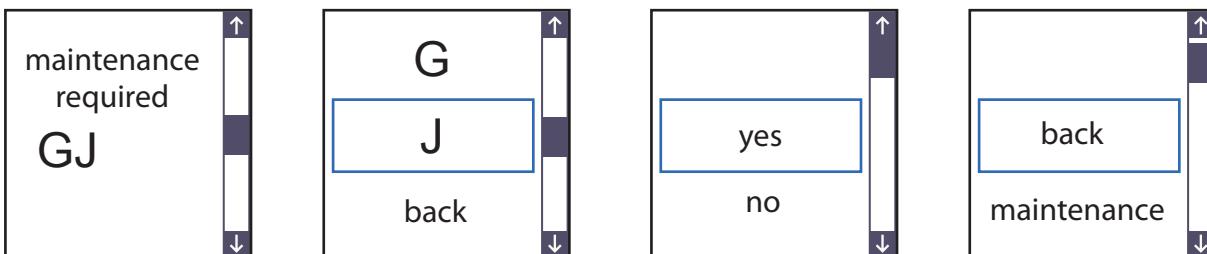
First access the maintenance menu as explained on page 8-13

On The Leading Ceiling Lift Display, Select Driven Hoist

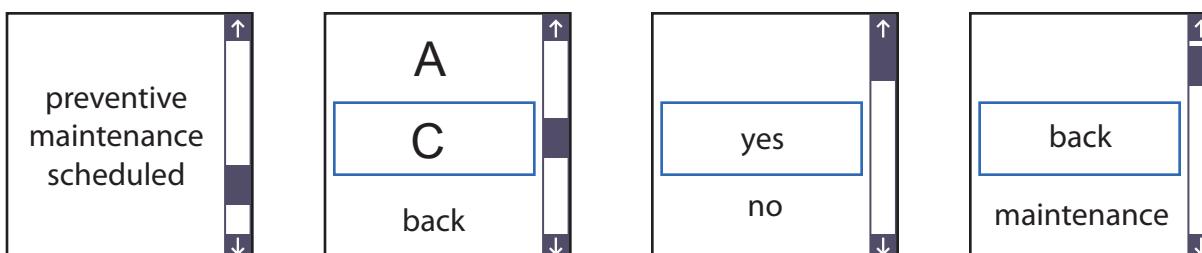


Once driven hoist has been selected, look at the driven ceiling lift display for the next steps.

When maintenance has been performed:



To reset the letter of maintenance performed before it is due and pops up on screen:



MALFUNCTION CODES TABLE

Code 08	Malfunction description	Up	Down	Holding system	Left/Right	Sit/Reclined
0	Memory fault	enable	enable	enable	enable	enable
1	Up/Down motor encoder fault	disable	enable	disable	enable	enable
2	High limit switch fault	disable	enable	enable	enable	enable
3	Up/Down motor drive fault	disable	disable	disable	enable	enable
4	Holding system* not functional	enable	enable	disable	enable	enable
5	Motor Up/Down wiring fault	disable	enable	enable	enable	enable
6	Up/down motor brake relay fault	enable	enable	enable	enable	enable
7	Overcurrent on Up action	disable	enable	disable	enable	enable
8	Overcurrent on Down action	disable	disable	disable	enable	enable
9	Overcurrent on Left/Right action	enable	enable	enable	disable	enable
10	Overcurrent on Sit/Lay action	enable	enable	enable	enable	disable
11	Real time clock fault	enable	enable	enable	enable	enable
12	Main board oscillator fault	enable	enable	enable	enable	enable
13	Unexpected current on Up/Down motor	disable	disable	disable	enable	enable
14	Unexpected current on Left/Right motor	enable	enable	enable	disable	enable
15	Unexpected current on Sit/Lay motor	enable	enable	enable	enable	disable
16	Battery charging overvoltage	enable	enable	enable	enable	enable
17	Supply of accessory is defect	enable	enable	enable	enable	enable
18	Abnormal tension detected during charging	enable	enable	enable	enable	enable
19	Rail accessory overcurrent	enable	enable	enable	enable	enable
20	ECS relay fault	enable	enable	enable	enable	enable
21	Power fail low voltage	stop	stop	stop	stop	stop
22	Power fail high voltage	stop	stop	stop	stop	stop
23	Unable to reach the station	enable	enable	enable	enable	enable
24	In Dual MS-2 Configuration, serial communication is interrupted Refer to Troubleshooting section	disable	enable	enable	enable	enable
25	In Dual MS-2 Configuration, the two hoists don't have the same SW version	disable	disable	disable	disable	disable
26	In Dual MS-2 Configuration, SWL jumpers of both hoist shall be 272 kg Refer to Troubleshooting section	disable	enable	enable	enable	enable

* Electrical brake that keeps the patient at the same height when the Up/Down is not activated

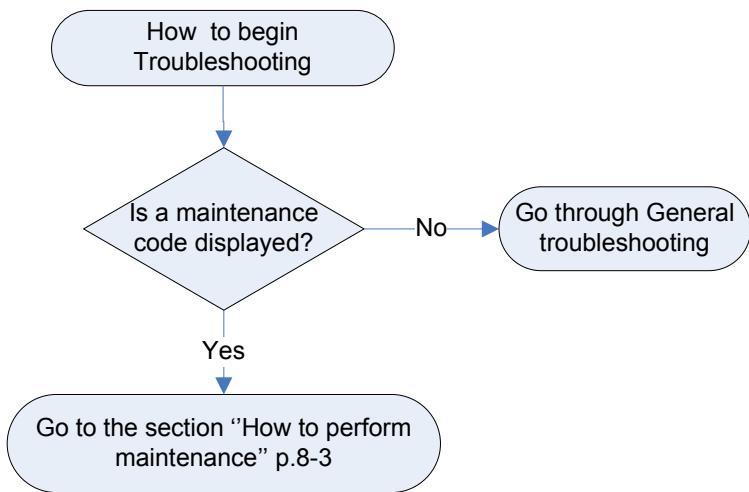
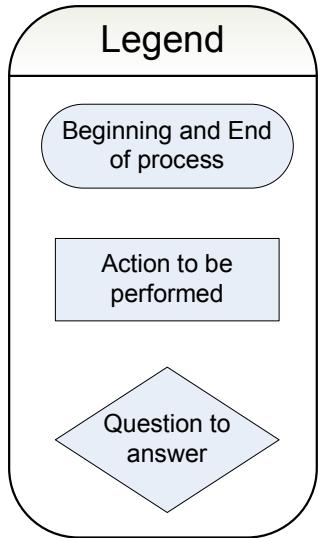
Authorization vs action

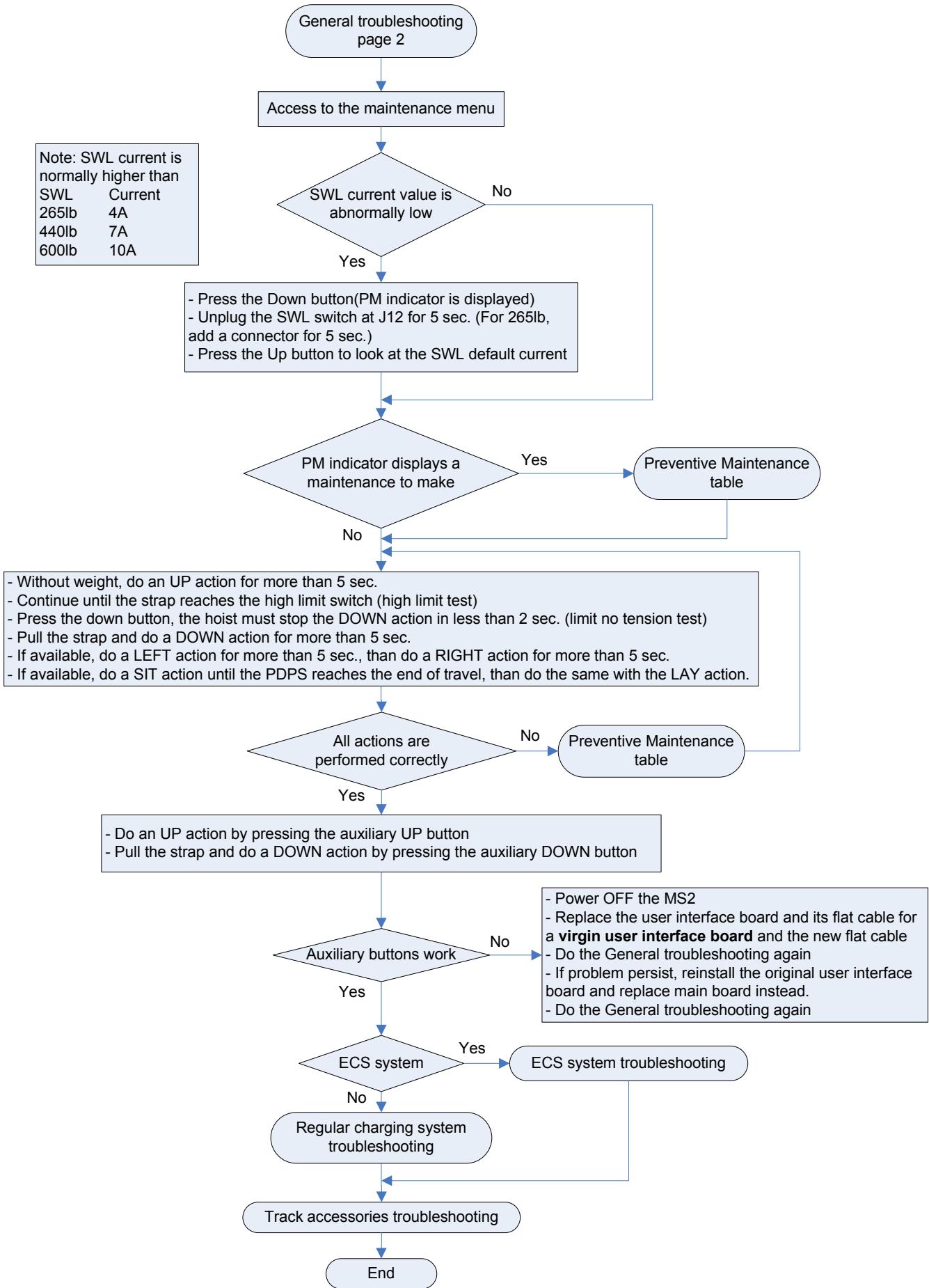
Enable: The function associated is allowed

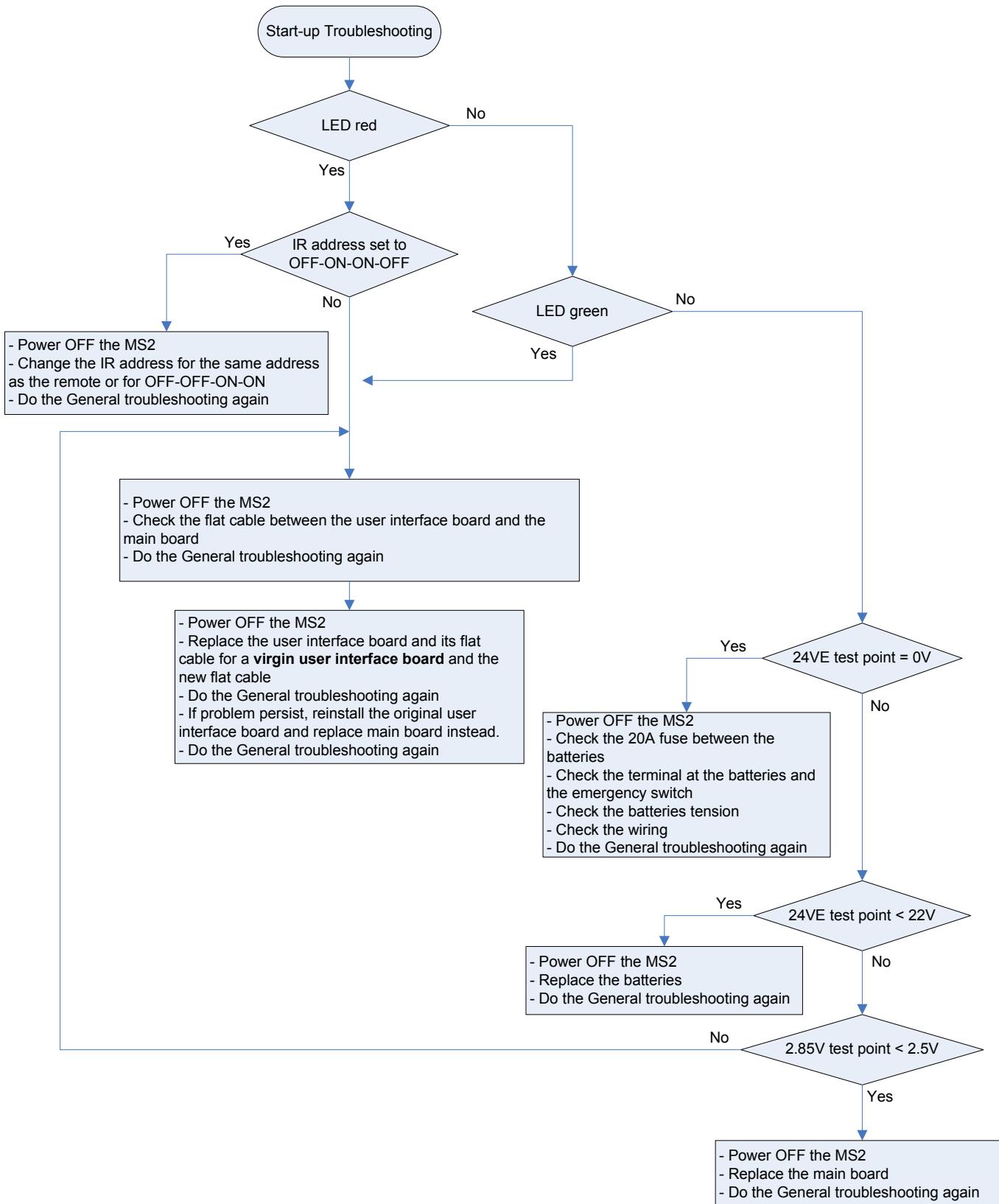
Disable: The function associated is not allowed

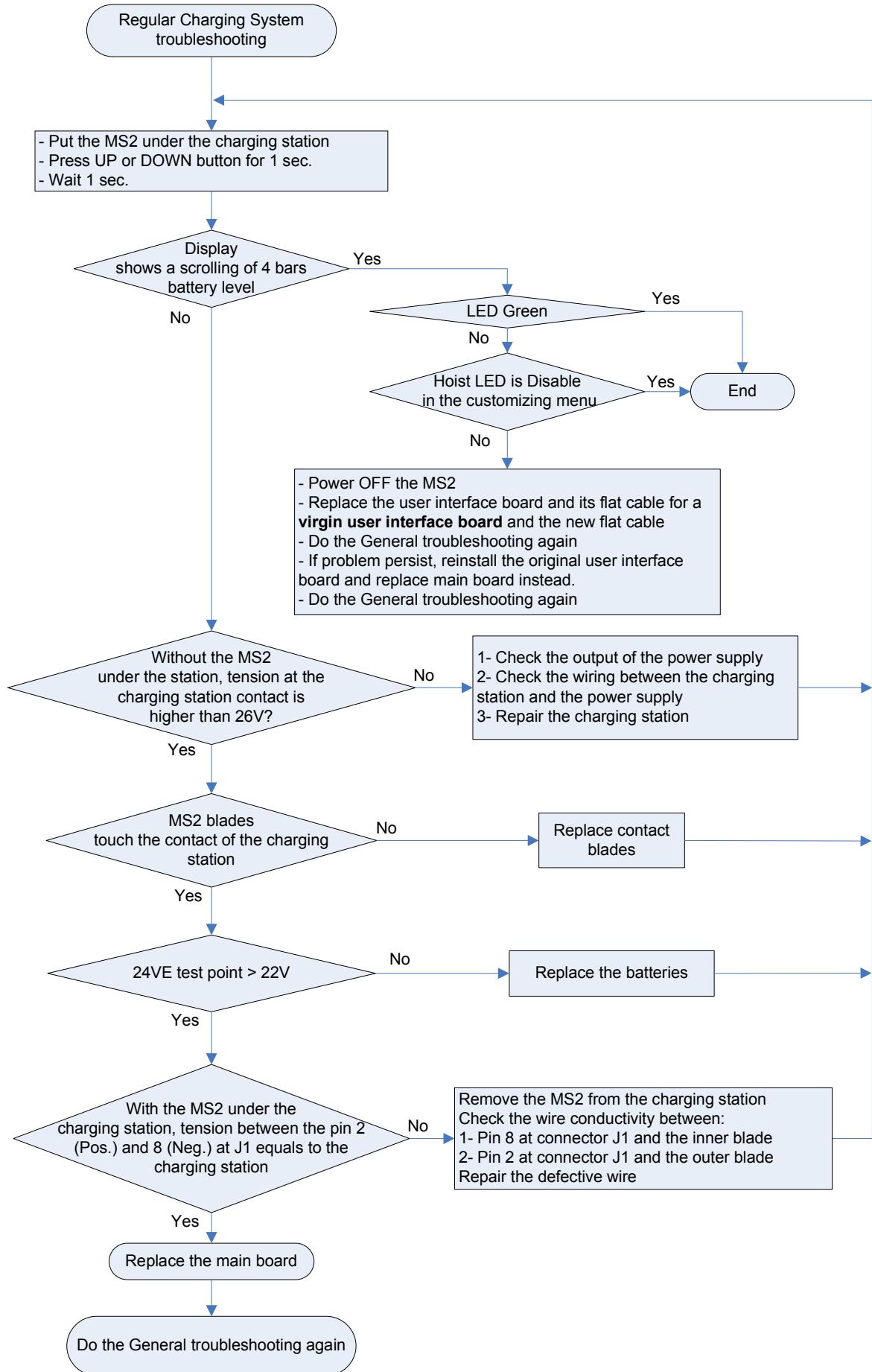
Stop: The motor associated stops immediately until the fault disappear

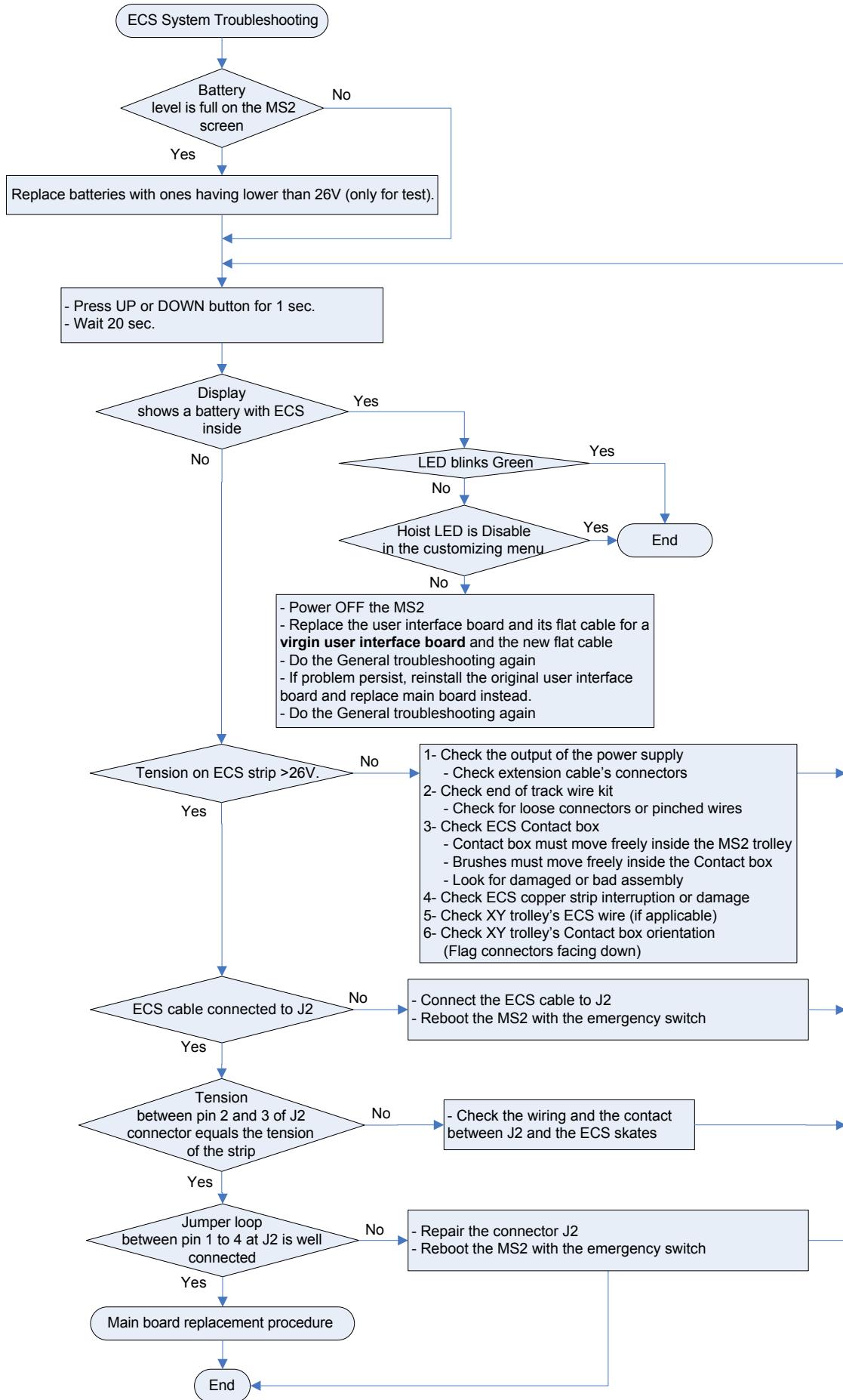
TROUBLESHOOTING

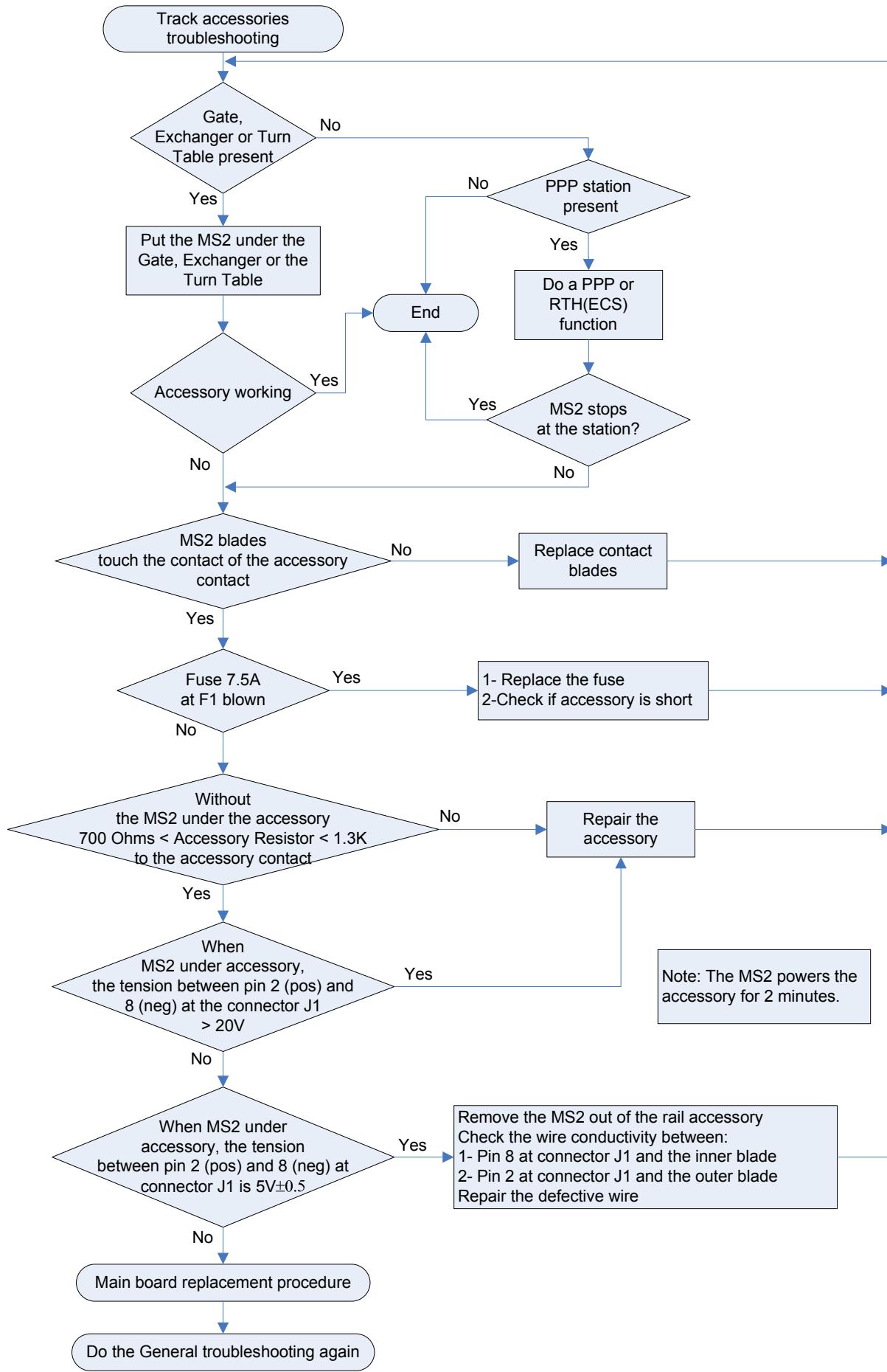


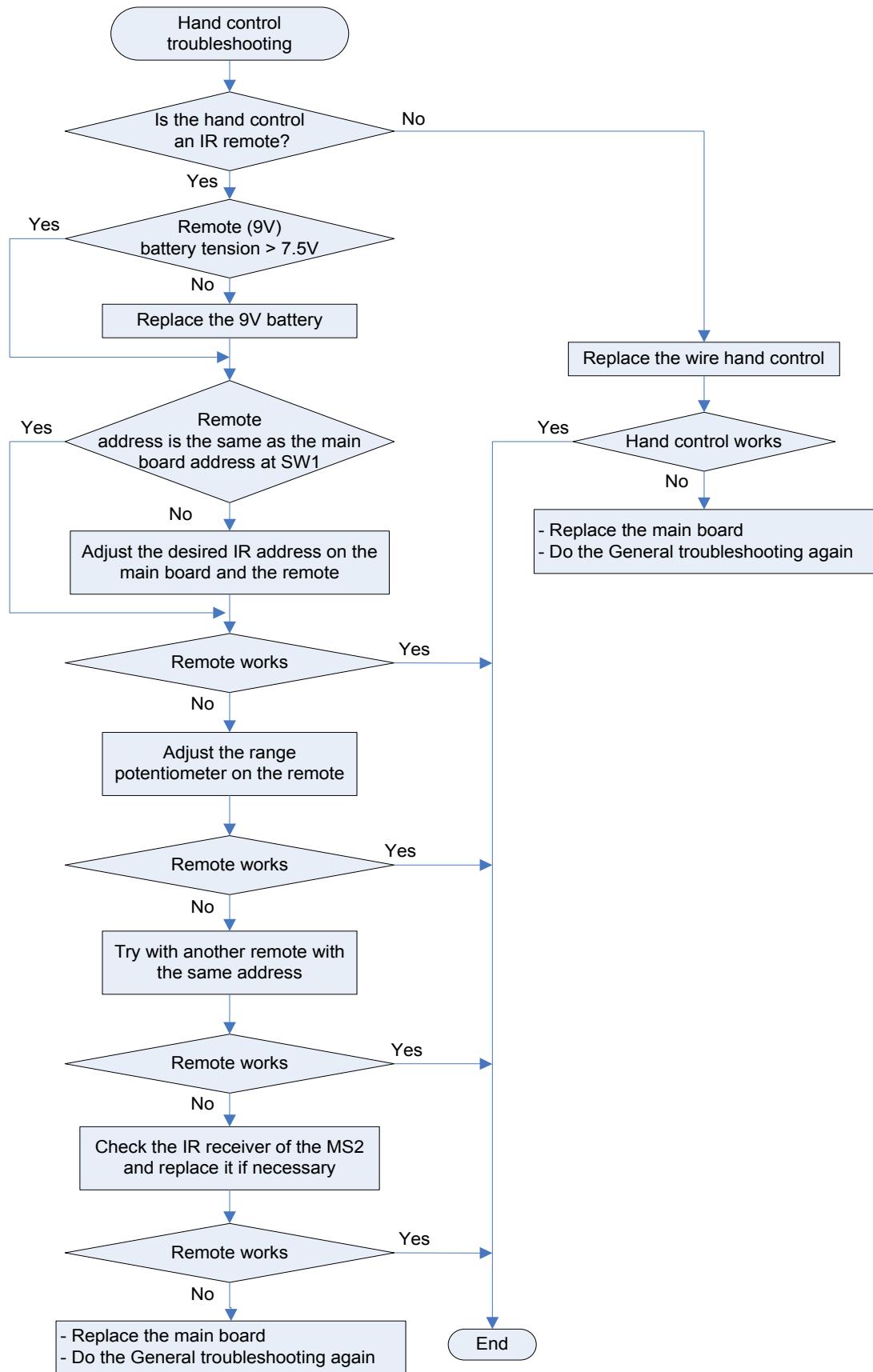












The Troubleshooting section continues on the next page.

For MS2 Plus a good reference for troubleshooting can be found in MS2 Plus Initial Start Up 001-31229-EN Troubleshooting section.

For Malfunction 24:

- Ensure serial communications cable is properly connected to J8 and J16 of both ceiling lifts.
- If problem persists, replace serial communication cable.

For Malfunction 26:

- Ensure that SWL red jumper (272 kg) of both ceiling lifts are properly connected to connector J12.

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